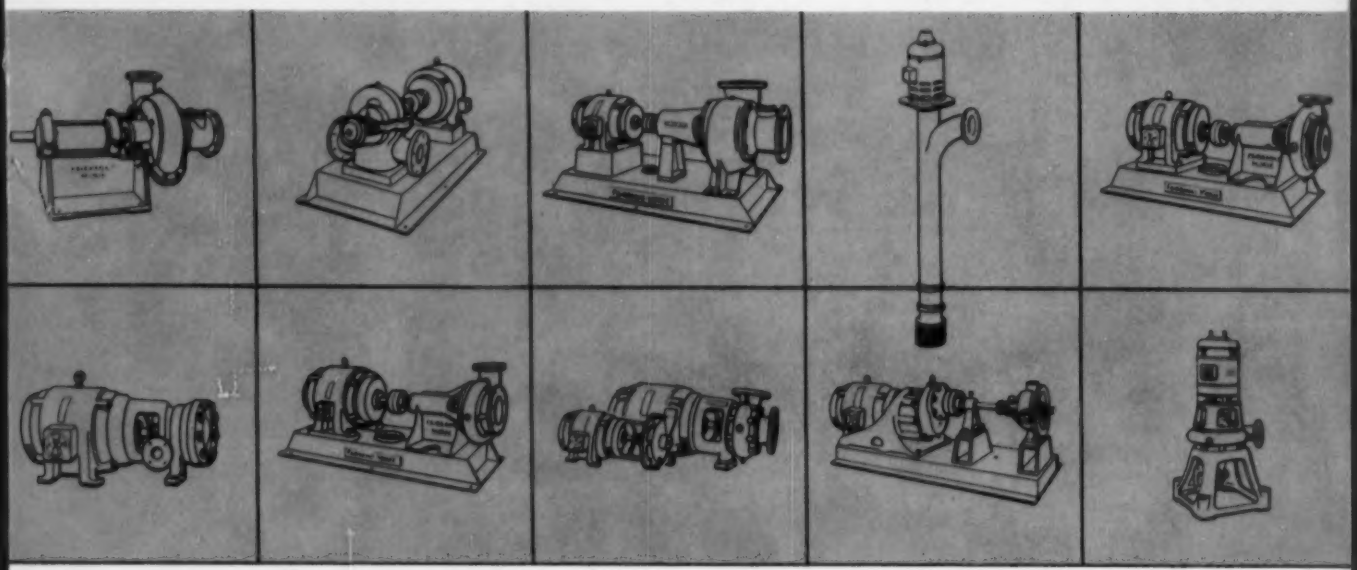
The Iron Age
A Chilton Publication
THE NATIONAL METALWORKING WEEKLY • NOVEMBER 10, 1955

Special Induction Heating Feature
See page 113



YOU CAN RELY ON YOUR F-M PUMP ENGINEER...

to solve any pump problems!

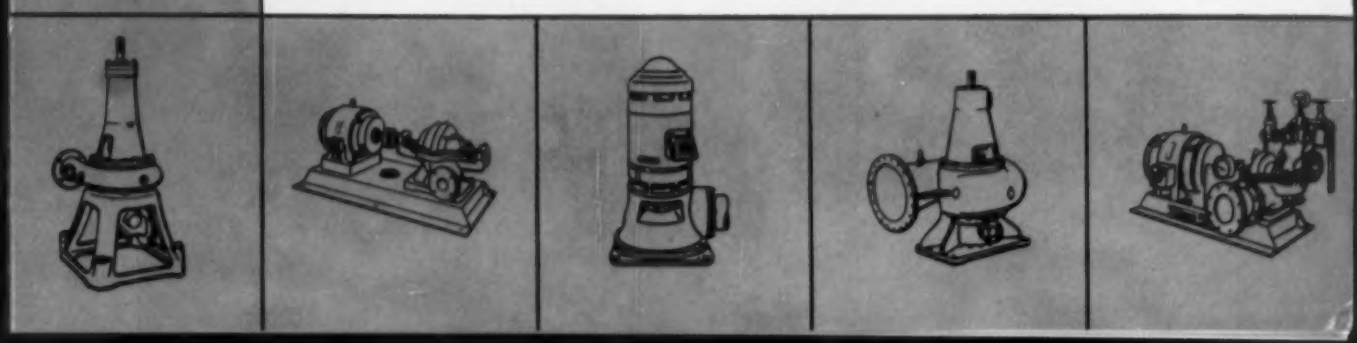
Troubled by a pumping problem? There's an easy solution. Call your Fairbanks-Morse Field Engineer. His business is solving your problems . . . selecting and applying pumps that will answer your needs most economically and efficiently.

Because Fairbanks-Morse is the world's largest manufacturer of a complete pump line, your nearby Fairbanks-Morse Field Engineer is not handicapped in his recommendations. He can select the pumps that offer you the most for your pump dollar. He has the field experience and is backed by the most experienced pump engineering department in the business. To solve your pump problems, call your Fairbanks-Morse Field Engineer. Fairbanks, Morse & Co., Pump Division, 3601 Kansas Ave., Kansas City, Kansas.

FAIRBANKS-MORSE

a name worth remembering when you want the best

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY
RAIL CARS • HOME WATER SERVICE EQUIPMENT • MOWERS • MAGNETOS



GIVE PRODUCTION PROBLEMS THE BIRD

Management and plants that are using leaded steels—either carbon or alloys—in their machining operations are giving thanks every day for these production line extras:

- Faster feeds and speeds
- Longer tool life
- A finer finish which often eliminates a finishing operation

Copperweld Leaded Steels are the steels with "built-in productivity"—the steels for quality production at competitive prices.

ARISTOLOY STEELS

For further details write for free booklet, "Lead Treated Steels"

COPPERWELD STEEL COMPANY • STEEL DIVISION • WARREN, OHIO

EXPORT: Copperweld Steel International Co., 117 Liberty St., New York 6, N. Y.

Tool Steel Topics

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

Production Up 50 pct with Bearcat Riveting Tool

For some time a manufacturer had been using a tool made of alloy steel, 2⅛ in. round, to cold-rivet weight-lever sets, 1 7/16 in. sq, for railroad switch stands. The tool was used in a series of rotating blows, average production being 70 pieces per tool before redressing was required.

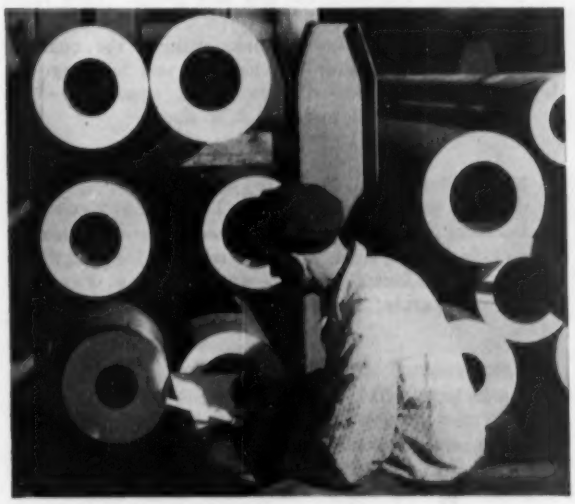
As the operation clearly called for steel with exceptional resistance to shock and wear, we suggested, "Why not give Bearcat a trial on that job? Bearcat's got the toughness you want. What's more, we wouldn't be surprised if it gave enough longer life to bring down your costs."

They made the change, with the result that tool life increased about 50 pct.

Bearcat is a tough, general-purpose grade of air-hardening tool steel. It has exceptional resistance to shock, and superior wear-resistance. Its air-hardening characteristic minimizes quenching hazards, and also provides good resistance to distortion in heat-treatment.

In addition to cold-riveting tools, there are many other applications in which Bearcat gives a good account of itself —in such tools, for example, as chisels, gripper dies, master hobs, hot headers, and die-casting die inserts.

Why not look into Bearcat? You can obtain full information from your Bethlehem tool steel distributor.



Save Time with Hollow-Bar in Ring-Type Applications

If you use draw rings, hardened bushings, ring dies or the like, you'll find you can save time in the shop with Hollow-Bar Tool Steel. Bethlehem Hollow-Bar comes in two types: BTR (oil-hardening) and Lehigh H (high-carbon, high-chrome). It's made by a high-speed trepanning process, which cores out the inside diameter of hammer-forged or hot-rolled, rough-turned bars. Hollow-Bar goes to work for you immediately. There's no waiting for forged rings or discs—nor are drilling, rough boring or facing, or rough turning required. Just think of the time that saves!

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Here's a Quick Look at Short-Run Dies

There are many types of dies used for blanking or forming where the production required may be only a few hundred pieces, or less. Such requirements occur frequently, as in the aircraft industry, for example. In such circumstances, the normal procedure of machining a die, then heat-treating and grinding it (to produce a die good for millions of parts) is neither practical nor economical. What is desired is a steel which can be machined to size, then used immediately.

One of our standard grades which is ideal for this application is Brake Die Tool Steel. Brake Die comes in rounds, squares and flats. It is a free-machining steel, and has been heat-treated at the mill to the highest hardness possible consistent with good machinability. On forming operations, dies made of Brake Die will last for tens of thousands of parts. And on blanking operations, it will produce anywhere from a few hundred parts to a few thousand, depending of course upon the type of material being blanked, and its thickness.

The Iron Age

DIGEST OF THE WEEK

Vol. 176, No. 19 November 10, 1955

Starred items are digested at the right

EDITORIAL
The Steel Shortage 7

NEWS OF INDUSTRY
*Special Report: Shipbuilding Outlook 67
*Business: Congress Probes General Motors 70
*Marketing: Simplify Fastener Pricing 71
*Raw Materials: Zinc Consumption Zooms 72
*Transportation: More Freight Goes By Air 74
*Defense: Camera Drone Aids Ground Troops .. 75
*Production: Freight Car Builders Struggle 76
Industrial Briefs 82
Personnel: Iron Age Salutes 97
Iron Age Introduces 101

NEWS ANALYSIS
Newsfront 65
Report to Management 81
Automotive Assembly Line 84
*This Week in Washington 89
West Coast Report 93
*Machine Tool High Spots 95

TECHNICAL ARTICLES
*Induction Heating 113
A special feature giving case histories of how induction heating is being put to use.
Melting 115
Heat Treating 118
Heating for Hot Forming 122
Joining 126
Core Boring 128
Technical Briefs 130

MARKETS & PRICES
*The Iron Age Summary—Steel Outlook 177
Steel Product Markets 180
Comparison of Prices 181
Iron and Steel Scrap Markets 182
Nonferrous Market 186
Steel Prices 189

REGULAR DEPARTMENTS
Dear Editor 9
Fatigue Cracks 11
Dates to Remember 13
Free Literature 156
New Equipment 166

INDEX OF ADVERTISERS 209

Copyright 1955, by Chilton Co. (Inc.)

THE IRON AGE, published every Thursday, with an additional issue in June by CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1953, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only, or to people actively engaged therein, $3 for 1 year, $5 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $15; other Foreign Countries, $25 per year. Single copies, 50¢. Annual Review Issue, $2.00. Cables: "Ironage," N. Y.

Address mail to Chestnut and 56th Sts., Philadelphia 39, Pa.

NEWS DEVELOPMENTS

U. S. SHIPBUILDING SEES SMOOTHER GOING—P. 67
After long period of rough weather, shipbuilders now have more orders, see some clear sailing ahead. But high costs of shipyard labor keeps costs far higher than foreign competition. And high pay for U. S. seamen makes operating expensive. Answer is in subsidies which are necessary for U. S. yards and lines to operate. Argument for subsidies is defense, which makes large merchant marine necessary.

WHAT'S BEHIND CONGRESS PROBE OF GM? — P. 70
Democrats are getting ready to make big business a 1956 campaign issue. Congressional committee sets four weeks aside to probe automotive giant, whereas a few days is usual probe schedule. GM must answer questions on dealer relationships, supplier ties, as well as questions on restraint of competition. But in Detroit competitive auto industry won't let GM or any other maker stand still.

FASTENER MAKERS SIMPLIFY PRICING SYSTEM—P. 71
Complicated price discounts have long plagued makers of nuts and bolts. Price clerks have had to wade through 36 possible discounts for any bolt group. They faced 30,000 to 40,000 possible increments. New system lumps discounts into a few groups, changes the quantity schedule. Distributor warehousing and handling discounts are revised. Change brings minor price adjustments; overall price level is same.

BUSINESS MOVES AHEAD ON ALL FRONTS — P. 81
Anyway you look at it, U. S. economy shows strength. Personal income continues at a record rate. September civilian employment hit 64.7 million, highest figure ever for the month. Unemployment is down. Pay rates are up sharply. All figures point to continued boom.

MANY PROTEST BUT TARIFFS WILL BE CUT — P. 89
Lower import duties are being pushed in Washington. The move is drawing strong industry protests and hearings will extend past November. But the Administration is listening to State Dept. arguments for reduced levies, will probably okay broad cuts.

GEAR GROUP STUDIES MACHINE TOOL NEEDS—P. 95
American Gear Manufacturers Assn. is trying to devise standards that will fit machine tool needs. Existing formulae leave gaps, make demands that are difficult to meet. Gear angles and materials are among the points of confusion. Builders run into trouble on some defense contracts calling for old specifications.

IN METALWORKING

MARKETS & PRICES

ZINC CONSUMPTION HEADED FOR RECORD — P. 72
Shipments of slab zinc will reach 1 million tons for first time this year. First half shipments are up 28 pct from last year. Diecasting is big factor in record year, but all consuming industries appear to be headed for larger consumption. Construction and auto industries show big increase in use.

AIR FREIGHT BUSINESS TAKES BIG JUMP — P. 74
Air freight shipments are up about 40 pct over last year. A wide range of industrial products are going air freight with metalworking items leading the way. Increased load is bringing an expansion in service as lines are taking on more permanent business. Air supply of spare parts is gaining favor as a means of reducing the need for warehouse stocks.

FREIGHT CARS SHORT, OUTLOOK BLEAK — P. 76
Shortage of steel and other problems keep freight car builders operating at only 50 pct of capacity. At this rate the railroads can't get enough new rolling stock to keep up with the cars that must be junked. ODM tax-jam deadline will help order backlog to hit 100,000.

MARKETS & PRICES

AUTO DEALER LAWS GET COURT TEST — P. 84
General Motors takes Colorado law to court. Statute protects dealers from losing their franchises without cause. Legal test could affect entire industry marketing pattern. National Automobile Dealers Assn. works in state legislatures to obtain adoption of other dealer protection laws. Test throws spotlight on strained dealer-manufacturer relationships.

WEST COAST MARKETS CONTINUE TO EXPAND—P. 93
Latest report on West Coast industrial expansion shows metalworking facilities springing up all over the place. Automotive bodies, electronic equipment, appliances, steel doors and screws are among the products calling for new and improved plants.

STEEL CONSUMERS TURN TO BARTER DEALS — P. 177
Desperate steel users are turning to barter deals to round up enough steel for their requirements. It's a matter of finding a fellow user who has what's needed and making a trade. Conversion deals are growing. They would be much more extensive if enough excess rolling mill space were available. More reports of production line slowdowns are being heard.

SPECIAL FEATURE

INDUCTION HEATING

In the past decade induction heating has grown from an electrical novelty to a shop-accepted heating means for mass production. Today the question is no longer "Will it work?" but "How much better will it work?"

MELTING —P. 115
Induction melting offers an inherent and distinct advantage: the same electrical energy that melts the metal also stirs it . . . an ideal combination in an alloying furnace. Melting action is fast, air exposure minimized.

HEAT TREATING —P. 118
Induction methods permit highly-efficient selective heat treating. And different heat treatments on the same work piece are practicable.

HEATING FOR HOT FORMING P. 122
Particularly suitable to forging and forming operations, induction offers several advantages. Rapid heating results in very low scale loss, therefore less metal loss and longer die life. And adaptability to mechanization permits automatic in-line processing.

JOINING —P. 126
Induction welding, brazing and soldering are fast, clean, economical. High production rates, superior product, freedom from distortion are advantages.

CORE BAKING —P. 128
Many foundrymen, turning to dielectric equipment in recent years, have reduced once-high rejects to negligible levels. Drying times are down to minutes.

Now! Vastly Improved Quenching with Salt!

ANY steel that can be hardened by oil quenching can now be martempered or austempered in the new Ajax Cataract Quench Salt Bath Furnace . . .

. . . with equal hardness and with all of the PLUS heat treating advantages that only molten salt can give.

This new Ajax Electric Salt Bath Furnace with its vastly increased cooling rate permits rapid quenching of steel parts through their critical temperature range.

Tremendous quenching power is obtained by an adjustable-speed pump. The downward flow of salt into the quenching header can be regulated for various hardenabilities.

Send specimen work to the Ajax Metallurgical Service Laboratory for a process demonstration—preferably in your presence . . . No obligation.

AJAX CATARACT QUENCH FURNACE

Provides greater quenching power than previously possible.

Permits heavy sections to be martempered and austempered. (Sections up to 6" diameter, can be martempered and sections up to 1¼" diameter austempered).

Assures high and uniform hardness.

Eliminates excessive distortion — As a rule, parts can be finish-machined *before* hardening.

Avoids danger of quench cracking.

Increases toughness and ductility.

Write for Bulletin 700

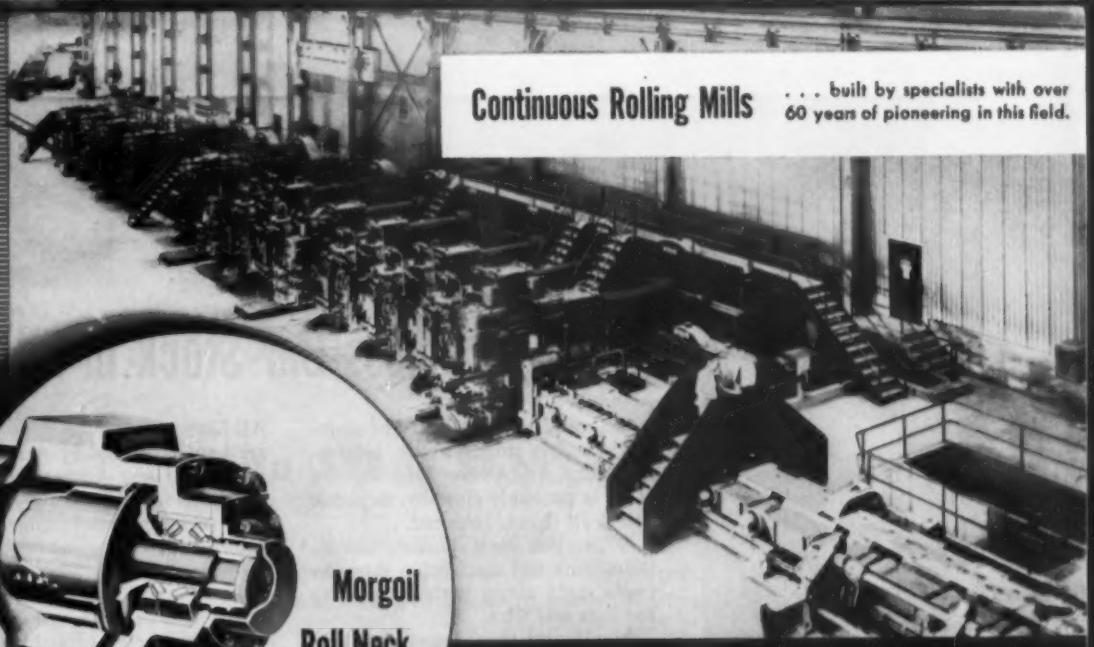
"Ajax Cataract Quench Furnaces," **and Technical Bulletin 500,** ***"The Present Status of Austempering and Martempering."***

AJAX HULTGREN

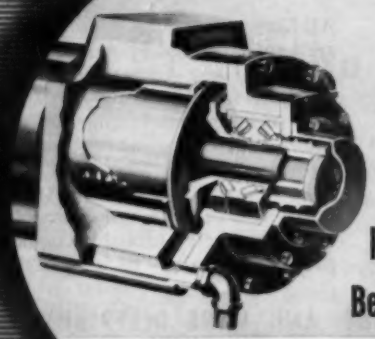
Associated Companies: Ajax Electric Furnace Corp.; Ajax Electrothermic Corp.; Ajax Engineering Corp.

electric SALT BATH furnaces

AJAX ELECTRIC COMPANY, 904 Frankford Ave., Phila. 23, Pa.



Continuous Rolling Mills . . . built by specialists with over 60 years of pioneering in this field.



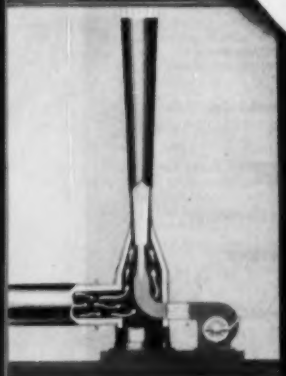
Morgoil Roll Neck Bearings

. . . will increase the accuracy of your product and save on operating and maintenance costs.

MORGAN WORCESTER

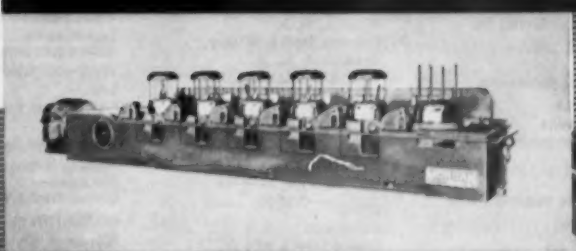
Can help you produce more and better steel products

G-2

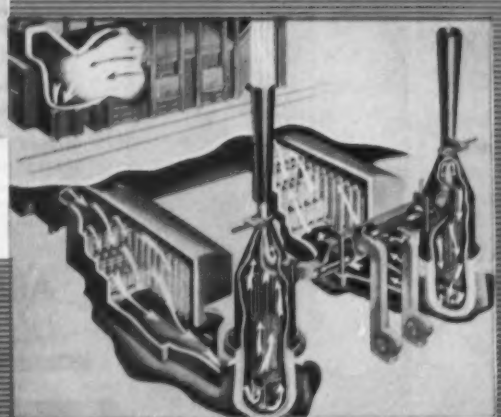


Morgan Ejectors

. . . efficiently handle hot gases and fumes as high as 3000° F.



Wire Machines . . . Morgan-Connors give high production, with low die cost, low power cost, low space requirement.



Furnace Control System

. . . Morgan-Isley increases efficiency of any regenerative furnace at relatively low installed cost.

MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS

Rolling Mills · Morgoil Bearings · Wire Mills
Regenerative Furnace Control · Ejectors · Gas Producers

English Representative
International Construction Co., 56 Kingsway, London, W. C. 2, England

Where to get Armco Stainless Bar Stock In a Hurry

If you need quick delivery of stainless steel bar stock or wire, remember this: An Armco Distributor's stock is probably close-by. A phone call is all that is required.

When you want stainless screws, bolts, nuts and accessories, they can come right along with your order for bars and wire.

You'll find that Armco Stainless Distributors know their business. All have mill-trained salesmen who are kept informed by Armco. They have the latest Armco literature—available for the asking—on forging, pickling, machining and the other fabricating operations on stainless steels.

Look over this list of Armco Stainless Steel Bar and Wire Distributors. There's probably one near you, in your own "back yard."

ARMCO STAINLESS STEEL BAR AND WIRE DISTRIBUTORS

ARIZONA
Phoenix
Bucommon Metals & Supply Co.

CALIFORNIA
Emeryville
Electric Steel Foundry Co.
Los Angeles & National City
Bucommon Metals & Supply Co.

COLORADO
Denver
Metal Goods Corporation

CONNECTICUT
Hartford
The Am. Steel & Aluminum Corp.
Peter A. Frasse & Co., Inc.

GEORGIA
Atlanta
J. M. Tull Metal & Supply Co.

ILLINOIS
Chicago
Central Steel & Wire Co.
Chicago Steel Service Co.

KANSAS
Wichita
Metal Goods Corporation

LOUISIANA
New Orleans
Metal Goods Corporation

MAINE
Auburn
Brown-Wales Company

MARYLAND
Baltimore
Seaboard Steel & Iron Corp.

MASSACHUSETTS
Cambridge
Brown-Wales Company
Industrial Steels, Inc.
Fall River
Congdon & Carpenter Co.

MICHIGAN
Detroit
Central Steel & Wire Co.

MISSOURI
North Kansas City
Metal Goods Corporation
St. Louis
Metal Goods Corporation

NEW YORK
Buffalo
Peter A. Frasse & Co., Inc.
Rochester
Follansbee Metals Corporation
Syracuse
Peter A. Frasse & Co., Inc.

METROPOLITAN NEW YORK
New York City
Peter A. Frasse & Co., Inc.
Hillside, N. J.
Edgcomb Steel & Al. Corp.
Lyndhurst, N. J.
Peter A. Frasse & Co., Inc.
Union, N. J.
Mapes & Sprowl Steel Co.

NORTH CAROLINA
Charlotte
Edgcomb Steel Company

OHIO
Cincinnati
Central Steel & Wire Co.
Cleveland
Cleveland Tool & Supply Co.
Viking Steel Company
Columbus
Vorys Brothers, Inc.

OKLAHOMA
Tulsa
Metal Goods Corporation

OREGON
Portland
Electric Steel Foundry Co.

PENNSYLVANIA
Philadelphia
Edgcomb Steel Company
Peter A. Frasse & Co., Inc.
Pittsburgh
Follansbee Metals Corporation
York
Edgcomb Steel Company

RHODE ISLAND
Providence
Congdon & Carpenter Company

TEXAS
Dallas
Metal Goods Corporation
Houston
Metal Goods Corporation
San Antonio
Metal Goods Corporation

WASHINGTON
Seattle
Electric Steel Foundry Co.
Spokane
Electric Steel Foundry Co.

WISCONSIN
Milwaukee
Central Steel & Wire Co.

DOMINION OF CANADA
Montreal, Quebec
Firth-Brown Steels, Ltd.
Toronto, Ontario
Firth-Brown Steels, Ltd.
Vancouver, B. C.
Esco, Ltd.

ARMCO STEEL CORPORATION
1575 CURTIS STREET, MIDDLETOWN, OHIO

ARMCO®

ARMCO STEEL — ARMCO DRAINAGE & METAL PRODUCTS, INC. — THE ARMCO INTERNATIONAL CORPORATION

the Iron Age

Chestnut and 56th Sts.
Philadelphia 39, Pa.
SHerwood 8-2000

GEORGE T. HOOK, Publisher

EDITORIAL STAFF

TOM C. CAMPBELL, Editor-in-Chief
GEORGE F. SULLIVAN, Editor

Managing Editor — E. C. Beaudet
News-Markets Editor — J. B. Delaney
Technical Editor — J. J. Obrzut
Engineering Editor — W. G. Patton
Machinery Editor — E. J. Egan, Jr.
Metallurgical Editor — P. Unterweiser
Asst. News Mkts. Ed. — R. D. Raddant
Art Director — J. A. Degen

Associate Editors: G. J. McManus, J. G. Long, D. G. Picinich. Assistant Editor: F. J. Stein. Regional Editors: K. W. Bennett, Chicago; T. M. Rohan, Cleveland; T. L. Carry, Detroit; W. G. Brookfield, Pittsburgh; G. G. Carr, New York; R. R. Kay, Los Angeles; G. H. Baker, R. M. Stroupe, H. R. Regelmbal, Washington, Production Asst.: C. G. Herndon. Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. M. Edmonds, St. Louis; J. Miller, San Francisco; R. Kazarian, Buffalo; Dan Coughlin, Seattle; F. Sanderson, Toronto; P. H. Morley, London, England; Chilton Editorial Board: Paul Wooton, Washington representative.

WASHINGTON EDITORIAL OFFICE

Washington 4.....National Press Bldg.

BUSINESS STAFF

Production Manager — Warren Owens
Director of Research — Oliver Johnson
Circulation Mgr. — W. M. Coffey
Promotion Manager — J. A. Crites
Asst. Research Dir. — Wm. Laimbeer

REGIONAL BUSINESS MANAGERS

Chicago 2 ..... T. H. Barry
1 N. LaSalle St. — Franklin 2-0203

Cleveland 14 ..... Robert W. Watts
1016 Nat'l City Bk. Bldg. — Main 1-2263

Columbus 15, Ohio .... Harry G. Mumm
LeVeque-Lincoln Tower — Capital 1-3764

Dallas 18 ..... G. A. Brauninger
8557 Eustis St. — Dallas 7-4176

Detroit 2 ..... Peirce Lewis
103 Pallister Ave. — Trinity 1-3120

Los Angeles 28 ..... R. Raymond Kay
2420 Cheremoya Ave. — Holy'd 7-0741

New York 17 ... C. H. Ober, C. T. Post
100 E. 42nd St. — Oxford 7-3400

Philadelphia 39 ..... B. L. Herman
56th & Chestnut Sts. — SHerwood 8-2000

Pittsburgh 22 ..... J. M. Spackman
1502 Park Bldg. — Atlantic 1-1832

W. Hartford 7 ..... Paul Bachman
62 Lasalle Rd. — Adams 2-0486

England ..... Harry Becker
National Provincial Bank Chambers, 15 Gratton St., Altrincham, Cheshire.

One of the Publications Owned and Published by Chilton Co. (Inc.), Chestnut & 56th Sts., Philadelphia 39, Pa.

OFFICERS AND DIRECTORS

Joseph S. Hildreth, Ch. of the Board
G. C. Busby, President

Vice-Presidents: P. M. Fahrendorf, Harry V. Duffy; Treasurer, William H. Vallar; Secretary, John Blair Moffett; Directors: George T. Hook, Maurice E. Cox, Frank P. Tighe, L. V. Rowlands, Robert E. McKenna, Irving E. Hand, Everit B. Terhune, Jr., R. W. Case, Jr., John C. Hildreth, Jr.

Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

November 10, 1955

Editorial:

The Steel Shortage

• THE CURRENT STEEL SHORTAGE started to build up months ago. Few steel people or their customers anticipated the big bulge in business. Now there is an academic argument over who is or isn't to blame.

When you can't get what you want there is a shortage. You aren't going to stand still for philosophical arguments; or I-told-you-so statements.

When you must cut your operations—as some steel customers have done—there is a shortage; it is serious to you. If you can't expand your operations there is a shortage; you don't care what caused it. If your output drops below your competitor's you flip a lid.

Whether a shortage is temporary is beside the point to one who can't get steel; can't get enough; or has to raise money to pay higher than mill prices. If you want to pooh pooh the steel shortage be careful where you do it—your customers may hear you.

There is a lot of emotion in customers' feelings. You can't expect them to be coldly objective about the facts. There have been few public statements by steel customers about how badly they have been hurt. Steel officials would quite properly deny it but most steel users feel that if they raise the roof publicly about their shortages they will get less steel.

The bulge in warehouse sales several months ago foretold the present shortage. No one is going to pay warehouse prices for carload lots unless he has to do so.

The recent step up in conversion steel sales is further proof that the steel shortage is real. No one pays such prices—$100 above the mill price—unless he needs the material; and can't get it from regular sources. The increase in premium prices and the expansion in broker sales at this time forecast an even tighter steel situation to come.

These higher priced routes to more steel supplies are a small part of the total steel picture. But they point up the crux of customer unhappiness—shortage of capacity during "good" times.

The current steel expansion program may eventually eliminate these troublesome periods. But today the shortage is real and it is serious.

Tom Campbell

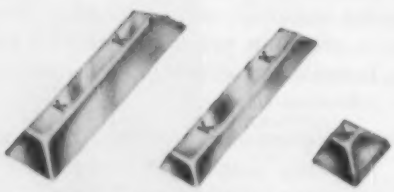
EDITOR-IN-CHIEF

HEAP BIG BLOWOUT!

Heap big "blow-out" – and *how!* It's our 40th birthday . . . and this is a good time to say "many thanks" to our customers. And to those folks who we hope will be customers in the many moons to come, may we say "You can always count on Keokuk Silvery Pig Iron. Car for car, pig for pig, its uniformity *never* varies. Charge it by magnet or count!"

Gratefully,

Chief Keokuk
Princess Wenatchee
X (*Chief Keokuk Jr.*)



Keokuk Silvery . . . the superior form of silicon introduction . . . available in 60 and 30 lb. pigs and 12 ½ lb. piglets . . . in regular or alloy analysis. Keokuk also manufactures high silicon metal.

SALES AGENT: MILLER AND COMPANY

332 S. Michigan Ave., Chicago 4, Illinois
3504 Carew Tower, Cincinnati 2, Ohio
8230 Forsyth Blvd., St. Louis 24, Missouri

dear editor: letters from readers

The Red Menace

Sir:

I have just read your editorial entitled "What Did Geneva Mean to You?" which appeared in the September 15th edition of your publication and the editorial entitled "Is the Russian Boot Pinching?" in your September 29th edition. These are excellent warnings to your readers that we must be ever watchful and alert to the communist menace. *J. Edgar Hoover, Director, Federal Bureau of Investigation, U. S. Dept. of Justice, Washington, D. C.*

More Steel for Your $

Sir:

We read with much interest your article on "How to Get More for your Steel Dollar" in the October 6th issue. Would you please be kind enough to send us, if available, four copies of this article for our future reference. *D. J. Beecher, American Flexible Coupling Co., Erie, Pa.*

Sir:

We would like very much to have two copies of the article "How to Get More for your Steel Dollar." We found this a very helpful and informative article. *G. M. Wamser, Sales Representative, The Babcock & Wilcox Co., Tubular Products Div., Milwaukee 46, Wis.*

Copies are still to be had for the asking.—Ed.

Too Much Mail

Sir:

I have received several notices about becoming a regular subscriber to THE IRON AGE. Our plant receives several copies and I am on the reading list; therefore I do read it each week. It's a great magazine and I enjoy reading it. If it were not on the mailing or reading list I surely would want a copy of my own.

Your issue of "100 Years of Metalworking" was great and I am keeping it for future reference. *Frank T. Vorac, Plt. Engr., National Malleable & Steel Castings Co., Sharon, Pa.*

Industrial Truck Costs

Sir:

We would appreciate your sending us a reprint of the article "How to Figure your Industrial Truck Costs" in the September 22nd issue of THE IRON AGE. *F. V. Herr, Mgr. Industrial Engineering Dept., Pratt & Letchworth, Buffalo, N. Y.*

Vacuum Melting

Sir:

We are interested in receiving two copies of the article "Install Vacuum Set Up for Dual Melting Role" in the June 23rd issue. *Nick Friesen, Melting Superintendent, Atlas Steels Limited, Welland, Canada.*

Largest Ferrous Casting

Sir:

Recently my friends and I got into a discussion on ferrous metallurgy and we disagreed on one issue. Perhaps you can help us out. We would like to know the largest (on a weight basis) ferrous casting ever poured. By casting we omit ingots which may have later been forged or rolled. *Kenneth Horton, 1618 E. Ocean Blvd., Long Beach, Calif.*

We can't give you a quick answer to your query but probably readers can help. —Ed.

MAXIMUM SAFETY AND WORK EFFICIENCY

NEW CONCEPT IN PRESS BRAKE DESIGN

NEW!

di-acro

Hydraulic Press Brake with STROKE CONTROL

* *STROKE CONTROL* means that you set the most practical length of stroke for each job—60 strokes per minute at ¼" stroke, 24 strokes per minute at 1½" stroke. The cam shaft does not make a full revolution as is true with flywheel driven press brakes.

Regardless of length of stroke used, *the ram speed is always constant* to insure safe, smooth, efficient operation. No violent whipping action of material.

Twelve tons of smooth hydraulic power is applied through a mechanical cam drive which assures perfect, positive alignment of bed. Ram can be "inched" or immediately backed-off. Capacity is 16 gauge steel across 36" bed. Wide variety of standard dies in stock.

For short run or experimental work use the Di-Acro hand operated Press Brake. Eight tons of power forms 16 gauge steel across the 24" bed. Uses standard dies.

di-acro PRECISION METALWORKING MACHINES

pronounced dy-ack-ro

Write for Press Brake literature

O'NEIL-IRWIN MANUFACTURING CO.
302 8th AVENUE, LAKE CITY, MINN.

11 TIMES THE SERVICE

Steel mill was using rag roll as pinch roll on a shear unit. It lasted about three months on the job. Oil, heat, cutting and pressure contributing toward short life.

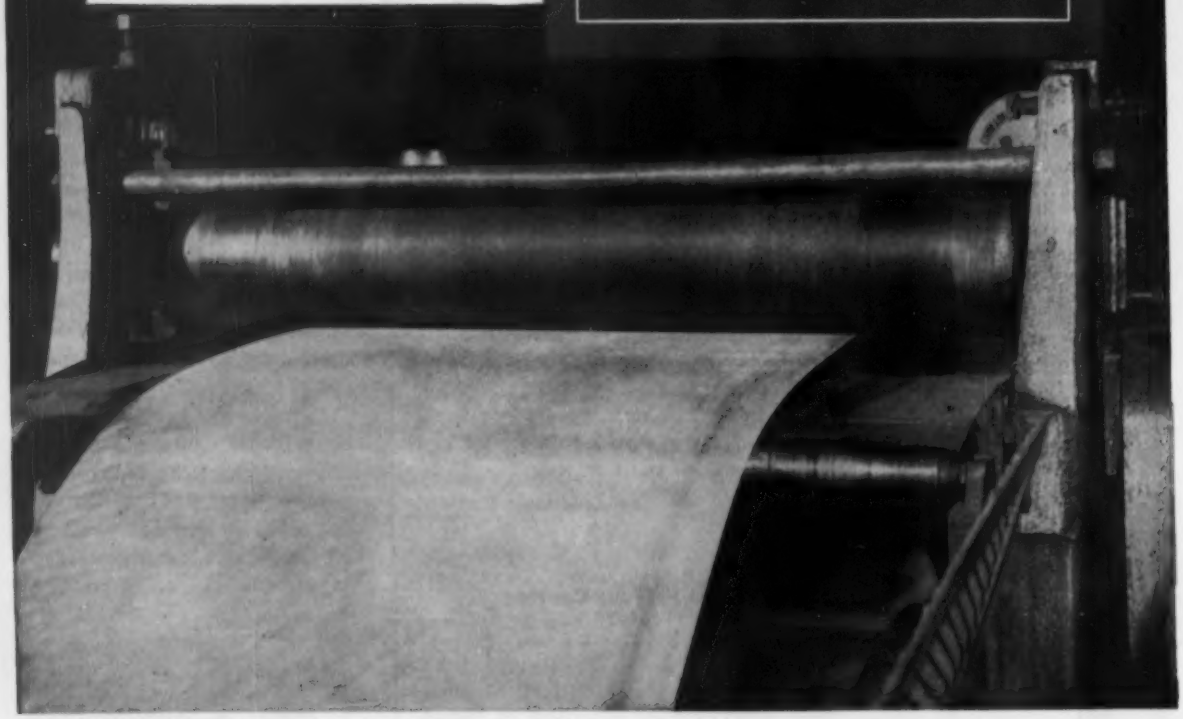
The G.T.M.—Goodyear Technical Man—recommended using a rubber-covered roll, specified compound and thickness to be used in covering the roll. This roll served 33 months—*11 times the service at a slightly lower original cost.*

Why not discuss your roll covering problems—or procurement of complete rolls—with the G.T.M., or write Goodyear, Industrial Products Div., Akron 16, Ohio.

GOODYEAR INDUSTRIAL PRODUCTS

GTM-Specified TYPICAL ROLL APPLICATIONS FOR STEEL MILLS

PROCESSES	TYPES OF ROLLS	
Electrolytic Tin Line	Scrubber	Slitter
Carbon Steel Pickling	Wringer	Tension
Continuous Galvanizing Line	Pinch	Directional Carrying
Continuous Annealing Line	Hold-down	Coating



YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing, Tank Lining, Rubber-Covered Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

We think you'll like
THE GOODYEAR TELEVISION PLAYHOUSE
every other Sunday—NBC TV Network

GOODYEAR

THE GREATEST NAME IN RUBBER

fatigue cracks

by William M. Coffey

Outside Iron Age

Heard about a sales meeting some time ago at which the usual things took place that take place at sales meetings. This one differed in only one little respect. A new home office man had been hired a few days before the meeting and this was his first introduction to the salesmen. Naturally he wanted to make a good impression. He figured, in correct Dale Carnegie style, that an elementary step towards this direction was to get their names right. Nothing worse than calling Stinky, Lefty and versa vica. He devised quite an interesting system to pin the right name on the right man. He jotted down on a small slip of paper the salesman's name and after it, in a few thoughtful adjectives, a distinguishing characteristic easily recognized. Here's what it looked like:

Salesman #1—large man, bombshell shirts

Salesman #2—my height, frog in throat

Salesman #3—gray hair, sedate, drinks Carstairs type

Salesman #4—moustache, r e a l gone

Salesman #5—roommate, sparse on top

Salesman #6—dirty cracks

Salesman #7—tallish, glasses, fishy-eyed

Salesman #8—sloping headline, loud speaker

Salesman #9—slick hair, pink bow tie

Salesman #10—glasses, red face

He was doing all right until they found the list.

Inside Iron Age

As is our usual practice we like to remind you from time to time of the editorial excellence of your ffj, an easy part of our job. Here are two more important "scoops" picked at random and published first in THE IRON AGE.

No doubt you've been reading in the press the big news about the jet air transport orders—been front page stuff almost everywhere. West Coast Report readers of IRON AGE had this dope in our Sept. 1 issue, page 77. Right there and then Ray Kay (Mr. California himself), our West Coast editor, told you that within 60 days orders for some $600 million in jet-transports would be awarded. To date, $444 million has been awarded and more will come any minute. All along we've been alerting our readers to the significance of this development.

More Inside Iron Age

And you may also have read recently a full column item by a nationally syndicated newspaper columnist pointing out how the Ford labor contract gives management the right to manage. It's a very important point that was rather widely overlooked. That's why we're happy that we gave it to you some months ago (THE IRON AGE, Aug. 8, p. 35).

It happens all the time. Keep sending it.**

Puzzlers

The answer to the egg puzzler (Oct. 20) is *at least* 83,161 eggs. We do believe, however, that another correct count would produce 479,001,601 eggs. Winners: Donald F. Stoneburner, Oak Ridge National Laboratory; Wm. E. McCord, Baltimore; C. Wm. McKinley; Leon J. Bercutt, I. J. Cohen & Co.; Abe Raich, C. F. & I. Corp.; J. H. Stanley, The Parker Appliance Co.; Charlsie-Berry-Letterman, General Steel Gang; E. L. Sweet, Standard Gage Co.; J. D. Smith, Sharon Steel Corp.; George W. Watt, Aluminum Co. of America; Robert F. Dillingham, Ford Motor Co.; Fred P. Boulais, Acme Steel Co.; and Jim Mull, The North American Manufacturing Co.

** *the money.*

If your sawing costs are mounting because you're not getting consistent low-cost operation, maximum production, and minimum downtime, call your Victor Distributor. He's the man who can bring your costs down to eye level. Once he's listened to your troubles, he'll recommend the *right* Victor Hand and Power Hacksaws, Metal and Wood Cutting Band Saws, and Hacksaw Frames for all your needs.

Your Victor Distributor will especially want to tell you about Victor "Moly"® High Speed steel blades. He'll tell you that "Moly" blades can save you real money because they outlast standard steel blades 10 to 1, cut as well as the *best* high speed steel blades made, and yet are substantially lower in cost!

And be sure to ask your Victor Distributor for a supply of our NEW Metal Cutting Booklets and Wall Charts. They're packed full of interesting information.

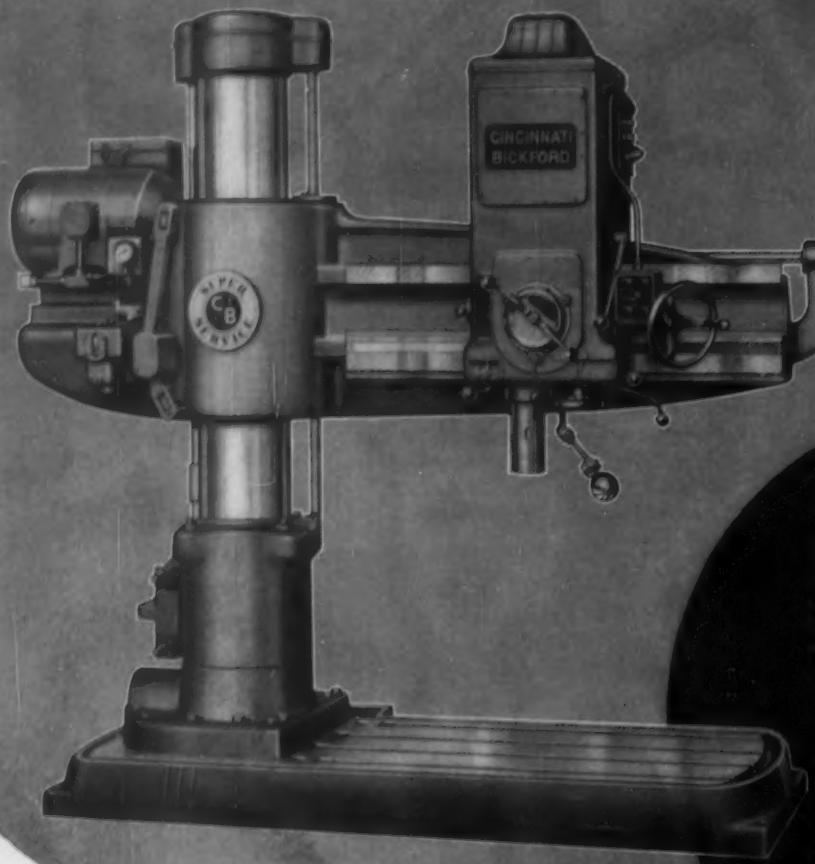
Sold Only Through Recognized Distributors

© 1955

VICTOR

SAW WORKS, INC., MIDDLETOWN, N.Y., U.S.A.
MAKERS OF HAND AND POWER HACKSAW BLADES, FRAMES, AND METAL AND WOOD CUTTING BAND SAW BLADES

new... Super Service RADIALS



The 9″ column machine
3′ or 4′ arm
5 h. p. driving motor

The 11″ column machine
3′, 4′ or 5′ arm
5 h. p. or 7½ h. p. motor

These new powerful 9″ and 11″ column Super-Service Radials, have 12 spindle speeds and 6 rates of power feed—all made through sliding gears. The very heavy and rigid frame, with an arm bearing on column 26″ long, permits use of maximum feeds and full horsepower.

Fast, easy handling results from convenient, direct-reading, simple controls; "finger-tip" feed engagement, use of anti-friction bearings throughout, and proper weight distribution. The driving motor, mounted on the arm, provides better balance of arm and head. Many other advantages are shown in new Bulletin R 31 . . . Write for it—today!

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

Subsidiary of GIDDINGS & LEWIS MACHINE TOOL CO., Fond Du Lac, Wisconsin

dates to remember

NOVEMBER

AMERICAN SOCIETY OF MECHANICAL ENGINEERS — Annual meeting, Nov. 13-18, Hotel Congress, Conrad Hilton, Sheraton - Blackstone, Chicago. Society headquarters are at 29 W. 39th St., New York.

NATIONAL METAL TRADES ASSN.—55th annual convention, Nov. 14-16, Sheraton-Plaza Hotel, Boston. Society headquarters, 155 E. 44th St., New York.

NATIONAL ELECTRICAL MANUFACTURERS ASSN.—Annual meeting, Nov. 14-18, Traymore Hotel, Atlantic City. Society headquarters, 155 E. 44th St., New York.

SOCIETY FOR EXPERIMENTAL STRESS ANALYSIS—Annual meeting and exhibition Nov. 16-18, Hotel Sheraton, Chicago. Society headquarters, 505 N. Michigan Ave., Chicago.

THE AMERICAN INSTITUTE OF CHEMICAL ENGINEERS — Annual meeting, Nov. 27-30, Statler Hotel, Detroit, Mich. Society headquarters, 25 W. 45th St., New York.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION — Annual convention, Nov. 28-Dec. 1, Boca Raton, Fla. Institute headquarters, 101 Park Ave., New York.

EXPOSITIONS

1955

SECOND INTERNATIONAL AUTOMATION EXPOSITION—Nov. 14-17, Navy Pier, Chicago. Society headquarters are at 845 Ridge Ave., Pittsburgh 12, Pa.

1956

ASTE—Industrial exposition, March 19-23, Chicago.

MATERIALS HANDLING SHOW, June 5-8, Cleveland.

DECEMBER

SOCIETY FOR APPLIED SPECTROSCOPY—Regular meeting, Dec. 6, Hotel New Yorker, New York City. Society headquarters, Johns-Manville Research Center, Manville, N. J.

AIME—13th annual electric furnace conference, Dec. 7-9, William Penn Hotel, Pittsburgh. Society headquarters, 29 West 39th St., New York.

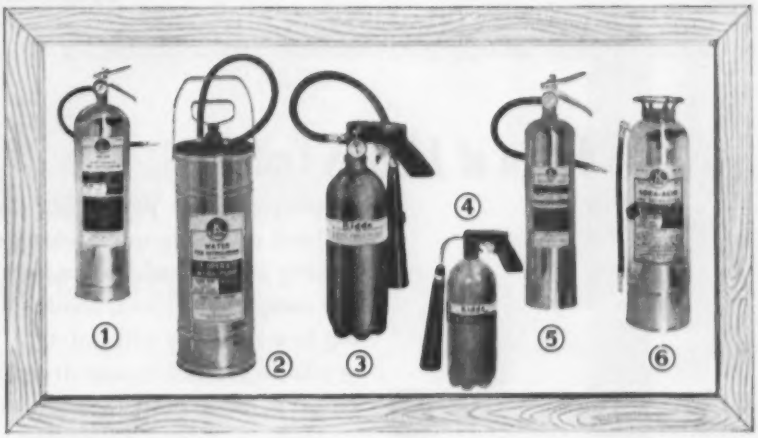
THE MATERIAL HANDLING INSTITUTE—Annual meeting, Dec. 12 & 13, Statler Hotel, New York City. Society headquarters, 813 Clark Bldg., Pittsburgh.

JANUARY

SOCIETY OF AUTOMOTIVE ENGINEERS, INC.—Annual meeting, Jan. 9-13, The Sheraton-Cadillac Hotel and Hotel Statler, Detroit. Society headquarters, 29 W. 39th St., New York.

PLANT MAINTENANCE & ENGINEERING SHOW—7th annual conference, Jan. 23-26, Convention Hall, Philadelphia. Society headquarters, Clapp & Polick, Inc., 341 Madison Ave., New York.

NOW! Brand-New Extinguishers Make Kidde Line Most Complete!



Efficient, dependable and superior in design, the new *expanded* line of Kidde extinguishers now makes it easier for you to choose the *right* extinguisher for every fire hazard!

1. Water and anti-freeze. Now available either air-pressurized or cartridge-operated, in either brass or stainless steel, 2½ gallon capacity.

2. Pump tanks. 2½ and 5-gallon sizes, in either galvanized or polished copper tank. Removable all-brass double-action pump throws 40-foot stream.

3. Dry chemical. Air-pressurized in 5 or 10-pound capacities, cartridge-operated in either 20 or 30-pound portables. 150-pound capacity wheeled unit for large hazards.

4. Carbon dioxide. Portables in 2½, 5, 10, 15 and 20-pound capacities, in either trigger or squeeze-valve models. Also wheeled units in single-cylinder capacities of 50, 75 and 100 pounds.

5. Vaporizing liquid. CTC or CBM, pump or air pressure operation with seamless drawn brass shell. Pump capacities 1 to 1½ quarts, pressurized capacities 1 and 1½ quart or 1 gallon.

6. Foam and soda-acid. Seamless drawn brass or stainless steel shell, in 2½ gallon size. Also available: 40-gallon soda-acid and foam wheeled units.

For more information on these and other extinguishers in Kidde's new expanded line, write today for the new Kidde P-8 catalog.

Walter Kidde & Company, Inc.
1149 Main Street, Belleville 9, N. J.
Walter Kidde & Company of Canada, Ltd., Montreal—Toronto

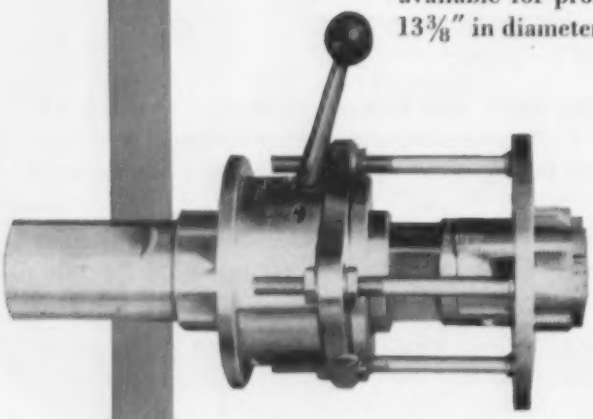
Kidde

The words 'Kidde', 'Lux', 'Lux-O-Matic', 'Fyre-Freez' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.

LANDIS Collapsible Taps

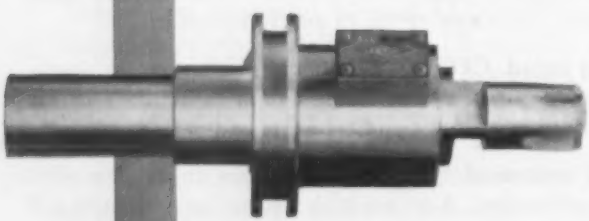
Sensitive Collapsing Action

The design of LANDIS Collapsible Taps reduces tool wear, "torn" threads and tapping time by permitting direct removal from the workpiece without reversing or "backing out". The sensitivity of this "collapsing action", which automatically withdraws the chasers from the completed thread, assures uniform thread lengths and threading to a shoulder with safety. Various sizes of LANDIS Taps are available for producing straight or tapered threads from 1¼" to 13⅜" in diameter.



ALT TAPS for straight threads

These taps feature a rugged construction and design simplicity which enable maximum chaser rigidity. The same tap may be used for either stationary (shown) or rotary application. Tapered threads can be tapped using chasers cutting across their entire width.

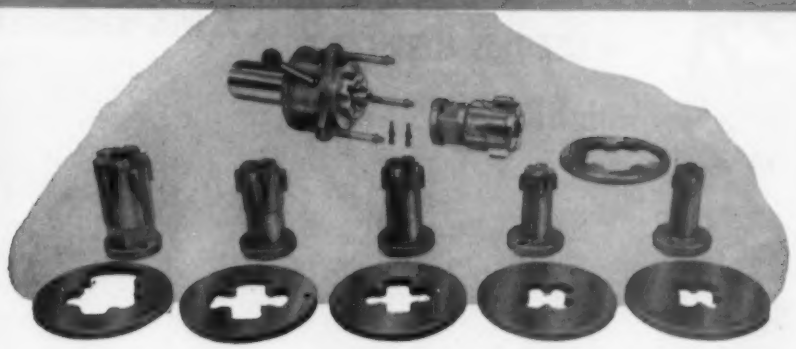


LL TAPS for tapered threads

The thread taper is produced by mechanical receding action of the chasers during threading. This action reduces cutting strains by restricting cutting action to the chaser throat or chamfer section. As little or no "cold working" can result, LL Taps are ideally suited for tapping tapered threads in stainless steel. These taps will also produce straight threads, and are available for either stationary or rotary applications.

Sensitive Collapsing Action

Straight or Tapered Threads Rotary or Stationary Use

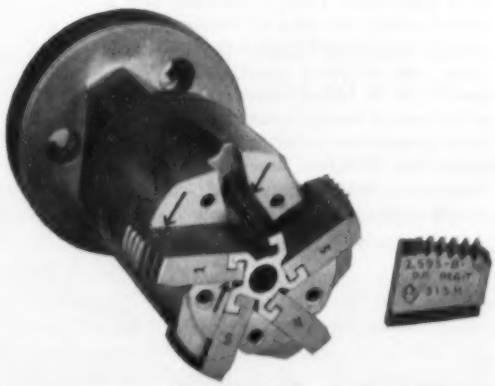


Wide Range Coverage

Detachable heads are a feature of all LANDIS Collapsible taps. This design allows tapping a wide range of thread diameters with minimum tooling—for example, the 3ALT body using 6 different heads will tap all diameters from 1¼" to 3¼". Each tap head itself has a wide threading range—the 1½" head will thread from 1⅜" to 1⅝", the 2" from 1⅞" to 2-5/16", the 3" from 2¾" to 3¼".

Maximum Rigidity

The basic design of all LANDIS Tap Heads assures maximum bearing support between the chaser, plunger and tap head body. In the cross-section illustration, note the heavy metal sections which provide rigidity to the chasers and plunger, particularly at the points where cutting strains are transmitted.



Size Adjustment Ease

All LANDIS Taps are designed so that they may be quickly adjusted approximately 1/32" over or under the nominal chaser size. The ratchet-type size-adjusting screw is conveniently located in the front of the tap. The movement of one ratchet tooth provides a self-locking diametrical adjustment of .001".

LANDIS *Machine* COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

430-C THE WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT - CUTTING - TAPPING - GRINDING - ROLLING

Straight or Tapered Threads Rotary or Stationary Use

- **INCREASE ROLL NECK BEARING LIFE**
- **ELIMINATE REMACHINING COSTS**
- **USE LESS LUBRICANT**

with BROOKS

LEADOLENE* Klingfast

Costly roll neck wear, remachining and down time can be eliminated in blooming, slabbing, structural, wire, skelp, lapping weld, rod and pipe mills—with Brooks Leadolene Klingfast. Having a thin film of semi-hardening nature, this lubricant does not hold scale which creates abrasive conditions. Scale is continually flushed out by water which does not affect or wash off this cost reducing lubricant. Furnished in grease or oil for hand packing or for use in pressure systems.

**The I.P. Lubricant with Indestructible pH-ilm.*

Read this Case Study

FOR PROOF OF LEADOLENE KLINGFAST'S SUPERIOR QUALITY AND COST REDUCING PERFORMANCE

In a lubrication study conducted over a period of one year on a 40" blooming mill, Brooks Leadolene Klingfast proved its efficient, cost reducing qualities. Best competitive E. P. Lubricants were consumed at the rate of twenty drums per week, and bearings wore out in two weeks' time. With Leadolene Klingfast, bearings showed no wear after twelve weeks and only four drums were consumed per week.

SEND COUPON FOR COMPLETE DATA!

The Brooks Oil Company
934 Ridge Avenue
Pittsburgh 12, Pa.

☐ Please send complete information on Leadolene Klingfast for roll neck lubrication.

NAME_____

COMPANY_____

TITLE_____

ADDRESS_____

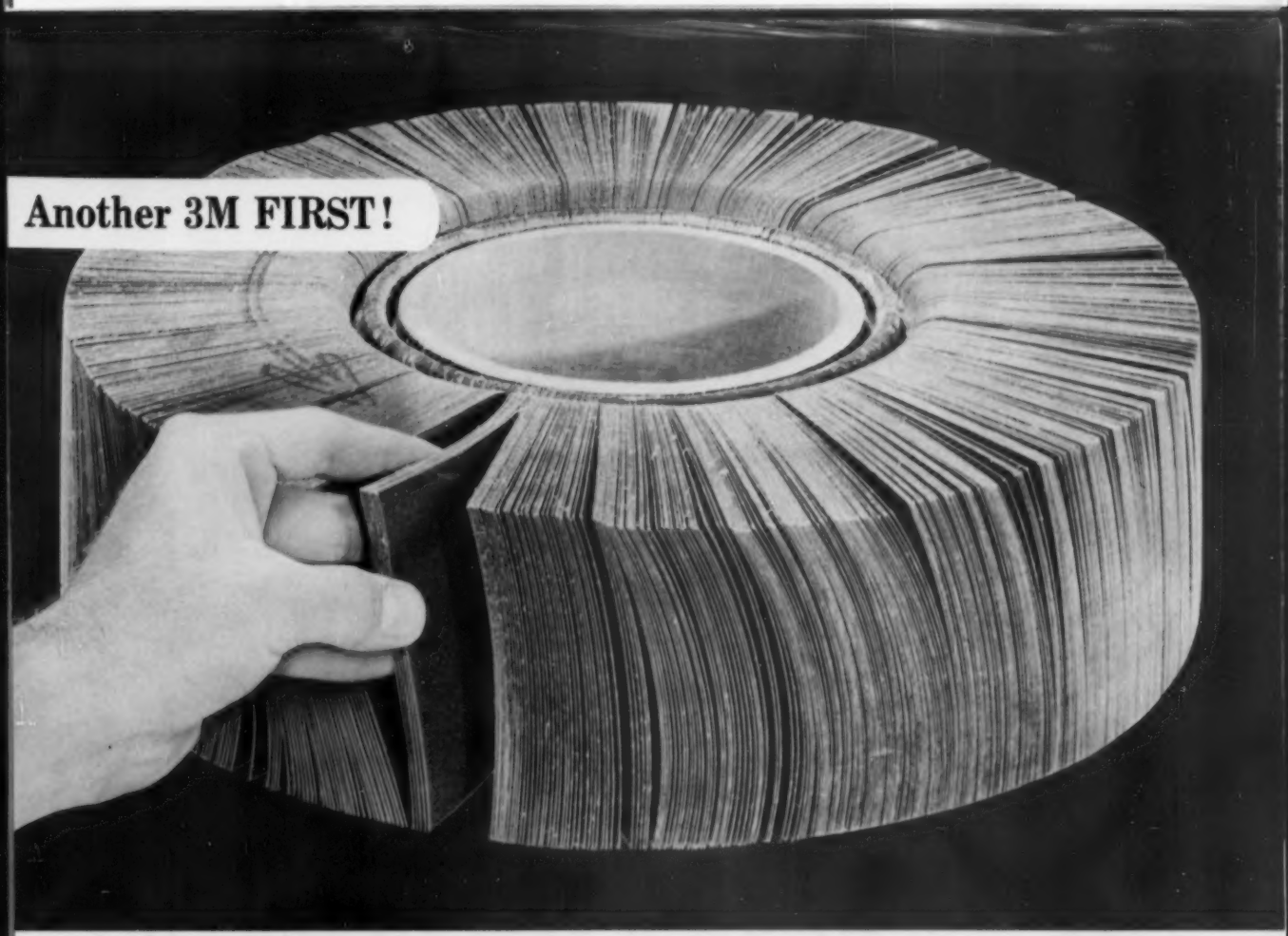
CITY_____ ZONE____ STATE_____

IA-355

The Brooks Oil Company

Since 1876

Executive Offices and Plant, Cleveland, Ohio
Executive Sales Offices, Pittsburgh, Pa.
Canadian Offices and Plant, Hamilton, Ontario
Cuban Office, Santiago de Cuba
Warehouses in Principal Industrial Cities



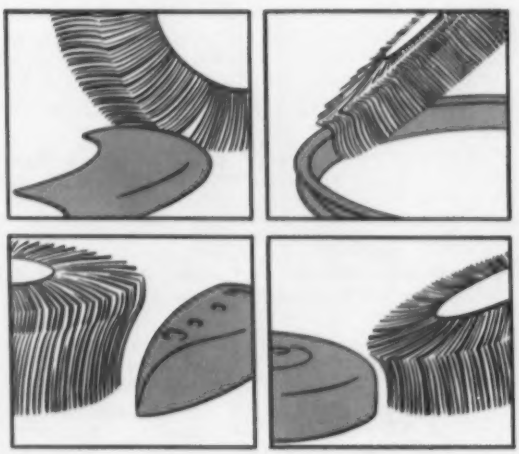
Now! 3M Introduces the "PG" Wheel

Obsoletes all other known methods for polishing and buffing contoured and flat surfaces prior to plating, painting or developing architectural finishes

The amazing new "PG" Wheel is a revolutionary new concept in coated abrasives application—the most significant development in the polishing field in the last 15 years. It reduces costs, increases production, improves finishes.

The "PG" Wheel—formed of over 1000 segments of cloth-backed 3M Coated Abrasive—is *self-conforming* and retains its shape throughout its working life. It requires *no* "breaking in" or dressing. It performs *all* the jobs formerly done by such methods as set-up wheels, sisal buffs, and rag buffs, yet also removes stock, if desired—features which no other coated abrasive on the market today can equal.

Installations in many plants have demonstrated that its production life is almost unbelievable. For example, in one plant a "PG" Wheel lasted 35 *hours* compared to a maximum of *15 to 20 minutes* for set-up wheels performing the same operation. At this same installation, where several "PG" Wheels turning at different RPM's were tested, the *lowest* "PG" Wheel life was 13 hours.



See "PG" Wheel Production Reports on following pages

"PG" WHEELS polish the entire inside area of Schwinn bicycle wheel rims. Fixtures holding rims revolve at 16 RPM on the rotary automatic machine. Dwell time at each grinding station is 10 seconds.

"Impossible" polishing job solved with "PG" Wheels!

Polishing the complete inside rims of 10-10 cold-rolled carbon steel bicycle rims was formerly an impossible job for the Arnold Schwinn Company of Chicago. This nationally known manufacturer was using set-up wheels and sisal buff wheels to blend flash weld on the rims, but was unable to polish them completely prior to plating.

Recently, this company tested 3M's amazing new "PG" Wheels on a rotary automatic machine. They found that three "PG" Wheels—a Grit 220 and Grit 240 Three-M-ite Resin Bond and a Grit 320 Tri-M-ite Resinite—perform the *whole* operation formerly done with set-up wheels and sisal buffs, *and* completely polish the inside wheel rim.

"PG" WHEEL conforms itself to sharp contours. It exposes fresh grain as it wears—will retain its shape throughout the entire life of the loading.

"PG" Wheel specifications

Available in Three-M-ite Resin Bond Cloth and Tri-M-ite Resinite Cloth

Diameters: .....14", 15", 16", 17"
Widths: .....2", 3", 4", 5", 6" *
Grits: .....#150 to #320

*for widths greater than 6", "PG" Wheels may be ganged for desired width.

"PG" WHEELS on an automatic straight line machine produce a 4 R.M.S. finish on auto bumper guards. Each "PG" Wheel polishes an average of 11,000 guards—lasts far in excess of an 8-hour shift.

"PG" Wheels increase production 80%

Oakman Plating Co., of Detroit, Michigan polishes cold-rolled steel auto bumper guards prior to plating. Its former method, using 12 set-up wheels and 8 sisal buffs, produced 2500 units per 8-hour shift with a 5 to 6 micro-inch finish. Set-up wheels seldom lasted more than *20 minutes* on the job before having to be replaced.

A 3M Engineer suggested that a test be made with "PG" Wheels. It was found that 13 "PG" Wheels of various grits replaced *all* set-up wheels and buffs—produced a 4 to 5 micro-inch finish—and increased production to *4500 units per 8-hour shift!*

Reason for this amazing production increase is that each "PG" Wheel lasts for several 8-hour shifts—down-time to replace set-up wheels is eliminated. Too, because of the better finish obtained with "PG" Wheels, the bumper guards' ultimate plated finish is far superior.

Here, the fixtures holding bumper guards turn over between stations to permit "PG" Wheel to polish the other side of the guard.

"PG" Wheel Assembly

3M's new "PG" Wheel can be assembled in a matter of seconds. Bushing can be supplied to fit any size drive spindle.

"PG" Wheel Production Reports . . .

Houdaille Hershey, Decatur, Illinois

PRODUCT: High quality automobile bumper guards.

OPERATION: Polishing over-all surface prior to plating.

3M METHOD: With the "PG" Wheel the quality of the bumper guard was greatly improved and this company is now obtaining far superior plated surfaces.

Unity Manufacturing Co.,
Chicago, Illinois

PRODUCT: Deep-drawn brass spotlight shells and steel foglight shells.

OPERATION: Remove draw marks, and scale, and polish over-all surface prior to plating.

PREVIOUS METHOD: Backstand belts, Grits 220 & 280, over entire surface.

3M METHOD: "PG" Wheel replaces #280 belt. Production costs lower. Greatly improved pre-plated surface. Ultimate appearance after plating: far superior.

Houdaille Hershey, Huntington, West Virginia

PRODUCT: Automobile bumpers.

OPERATION: Polishing contoured ends prior to bright nickel plating.

3M METHOD: With "PG" Wheels, the finish on the pre-plated surface was greatly improved, permitting a higher quality plated surface on the finished bumper.

Send coupon TODAY for full facts!

Minnesota Mining and Mfg. Co.
Dept. GJ-115, St. Paul 6, Minn.

☐ Send me case history reports on the "PG" Wheel

☐ Please have 3M Representative call

Name.....

Title.....

Company.....

Address.....

City.....Zone...State.....

PRODUCT OF 3M RESEARCH

3M ABRASIVES

Made in U.S.A. by Minnesota Mining and Mfg. Co. General Offices: St. Paul 6, Minn. In Canada: P.O. Box 757, London, Ontario. Export Sales Office: 99 Park Avenue, New York City. Makers of "SCOTCH" Brand Pressure-Sensitive Tapes, "SCOTCH" Brand Magnetic Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "SCOTCHLITE" Reflective Sheeting, "SAFETY-WALK" Non-slip Surfacing.

Here is perfection!

ROEBLING high carbon wire is unsurpassed for industry today. Roebling wire is absolutely true to specifications ...absolutely uniform in gauge and finish. Manufacturers who try Roebling wire once, become Roebling customers from then on.

You *pay* for the best when you buy high carbon wire. Make sure that you *get* it! Always specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

The Jonker, world's largest emerald-cut diamond.

ROEBLING

A subsidiary of The Colorado Fuel and Iron Corporation

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

PORTAGE offers 10 MINUTE change over time

FROM BORING, MILLING, DRILLING to DUPLICATING

...all in ONE machine...from ONE source

Boring, Drilling, Milling and Duplicating operations all done in one set up
... one machine ... one operator, no loss of change over time.

P. J. Holstein, President
The Superior Die, Tool & Machine Co.
Columbus 7, Ohio

Read What One User Has to Say!

Portage Machine Company
1035 Sweitzer Avenue
Akron 11, Ohio

Gentlemen:

Before going in for this type setup, I completely investigated all other types of contouring machines and found that we could be a lot more universal with the Portage Boring Mill and Turchan Hydraulic Follower because we can accurately bore a series of holes, mill pockets and also outside bosses, where the other machines would only contour.

Today more than ever the die business is becoming more and more complicated due to the irregular shapes and designs of these stampings, and I don't see how any Tool and Die Shop can compete without having this type of equipment.

Yours very truly,

P. J. Holstein

THE SUPERIOR DIE, TOOL & MACHINE CO.

PORTAGE

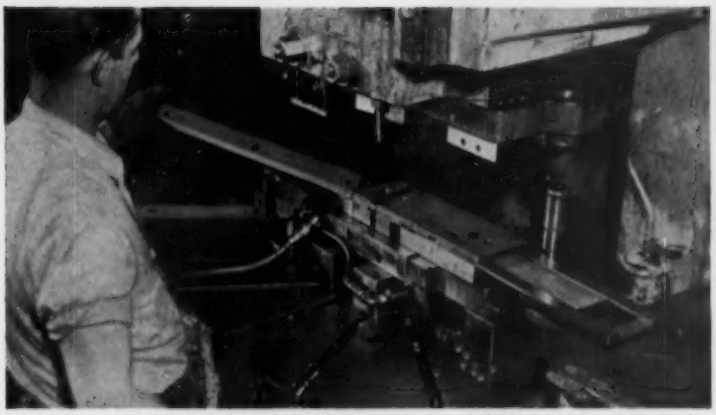
THE PORTAGE MACHINE CO.

1035 Sweitzer Avenue • Akron 11, Ohio

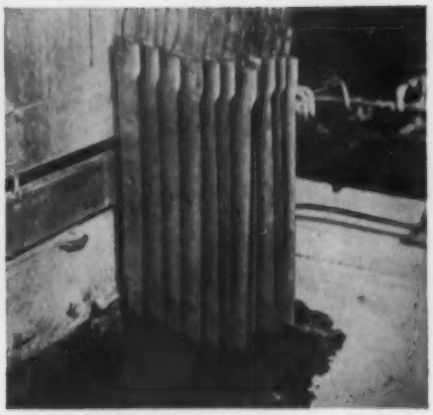
Representatives in Principal Cities

BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916

Cutter blade of Crucible alloy steel.



First step in manufacture of cutter blade. Crucible beveled blade alloy steel is fed through this 100-ton press, where it is cut to length and holes punched.



Next, lengths are formed to shape on a hydraulic press, and then given a tempering bath as shown.

CRUCIBLE ALLOY STEEL *cuts blade damage in rotary mowers . . .*

Lawn-Boy mower. Built by RPM Manufacturing Co., Lamar, Mo., a subsidiary of Outboard, Marine & Manufacturing Company, maker of Johnson & Evinrude outboard motors.

Rotary lawnmower cutter blades, whirling at high speeds, often hit small rocks or bits of trash. Ordinary steels just can't take that sort of rugged treatment. They chip, crack — wear out far too quickly. That's why in leading mowers, like the new *Lawn-Boy*, you'll find special *alloy* steel cutter blades *designed for reliable performance.*

For Crucible has developed a *special alloy steel* made to give the best possible combination of toughness and hardness for long-lasting edges—and formability and ductility for ease of manufacture. It's been so successful that *Crucible is now the largest producer of lawnmower steels.*

Most Crucible steels are designed to fill *special* needs. If you have an application where ordinary steels won't do, come to Crucible. Take advantage, too, of the dozens of technical booklets and data sheets Crucible has prepared to help you make the best use of special steels. For a free publication catalog, write *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

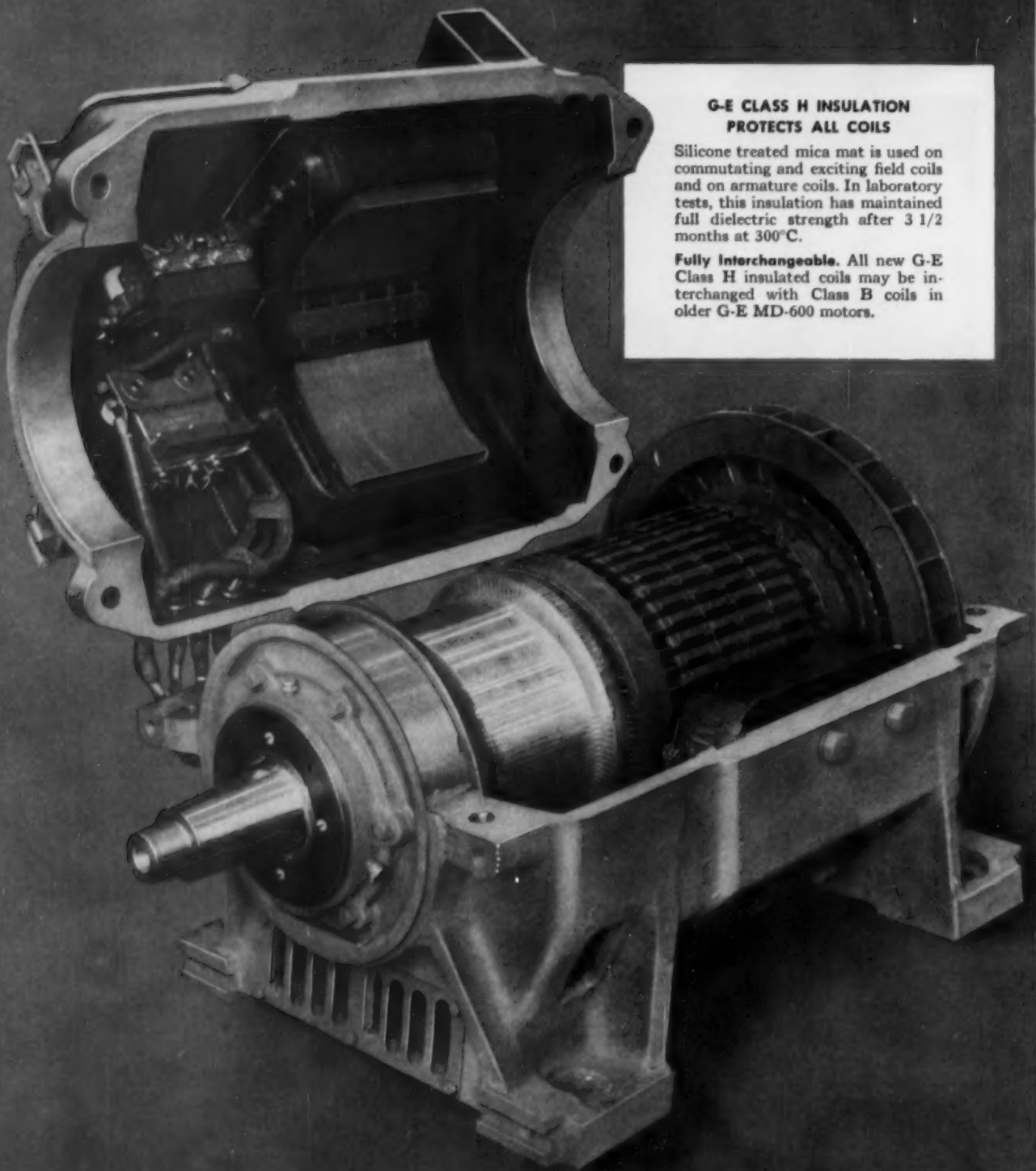
CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

PROGRESS IN
DIRECT-CURRENT DRIVES

NOW! Roastouts

NEW G-E MD-600 MOTORS



G-E CLASS H INSULATION PROTECTS ALL COILS

Silicone treated mica mat is used on commutating and exciting field coils and on armature coils. In laboratory tests, this insulation has maintained full dielectric strength after 3 1/2 months at 300°C.

Fully Interchangeable. All new G-E Class H insulated coils may be interchanged with Class B coils in older G-E MD-600 motors.

Virtually Eliminated on . . .

WITH CLASS H INSULATION

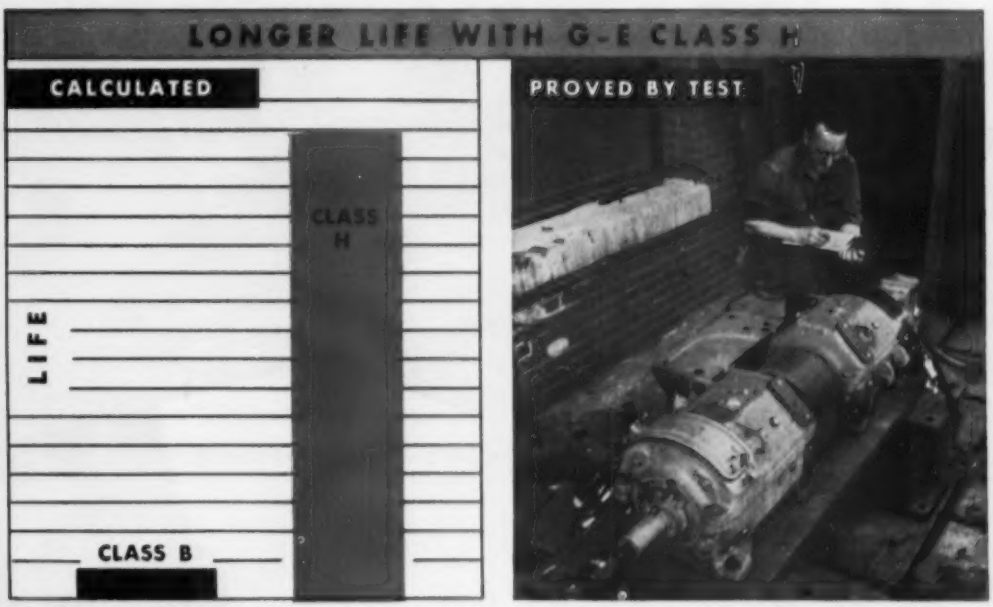
G.E. offers—in all MD-600's—Class H Insulated Coils

WHAT IS CLASS H? General Electric research has developed a combination of inorganic and silicone materials for a new insulation system now used in all MD-600 motors. These Class H materials will withstand temperatures up to 180°C continuously.

BETTER FOR HEAVY DUTY. Auxiliary mill motors often encounter unexpected high ambient temperatures, unforeseen extended duty or emergency conditions. Any one of these can cause "roastouts" from temperatures higher than the insulation capacity. The new G-E Class H insulation will resist up to 50°C more than Class B, resulting in longer motor service.

REWINDS ELIMINATED? On normal duty, insulation failure may be eliminated as the limiting factor in continuous armored motor service. Engineers calculate that each 10°C rise in temperature reduces the life of a given type of insulation by half. *Since G-E Class H will withstand 50°C higher than Class B, its life* **at the same temperature** *should be increased 2^5 or 32 times!*

YOUR G-E SALES REPRESENTATIVE HAS COMPLETE INFORMATION. Contact him at your nearby G-E Apparatus Sales Office, or write Section 812-1, Direct Current Motor and Generator Department, General Electric Company, Erie, Pennsylvania.



ENGINEERING STUDIES indicate that under identical operating conditions new G-E Class H insulated coils in MD-600 motors will last up to *32 times* as long as conventional Class B coils. Insulation failure may be eliminated as the limiting factor in continuous auxiliary mill motor service.

ACTUAL TEST with Class H and Class B motors coupled together *proves to date* the new insulation will last more than twice as long as the old. After burning out two Class B insulated motors, the one with Class H coils is still operating under exaggerated load, vibration and atmospheric conditions.

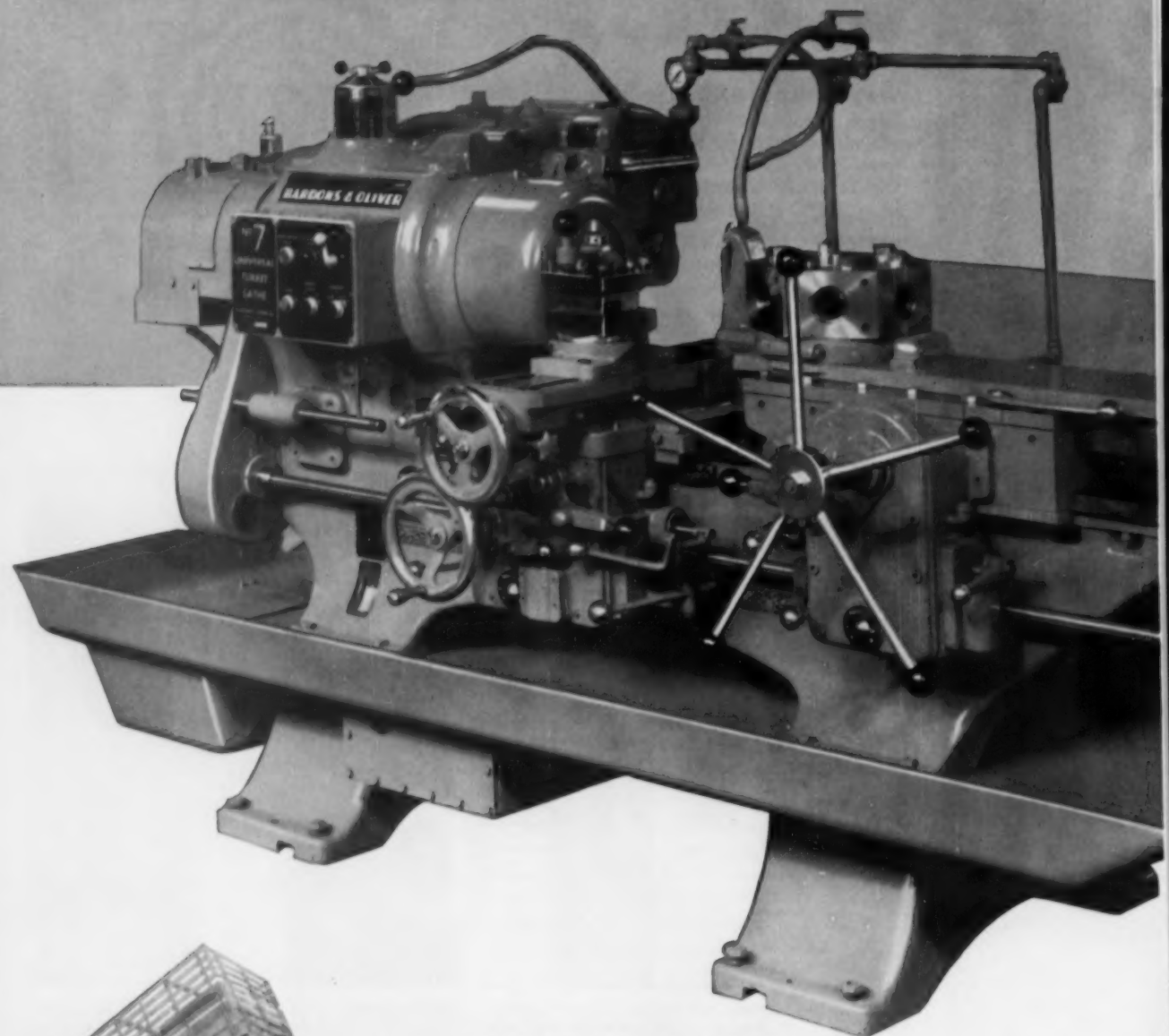
Progress Is Our Most Important Product

GENERAL ELECTRIC

Two No. 7 BARDONS & OLIVER

(4½" CAPACITY)

4 other machines . . . and . . .

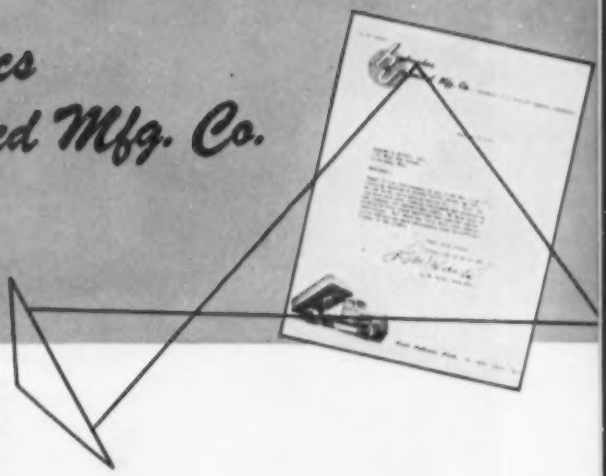


Hydraulics Unlimited Mfg. Co., Eaton, Colorado, are manufacturers of Hydraulic Hoists for trucks, pickups and trailers.

GENERAL ELECTRIC

TURRET LATHES Eliminate combine 12 operations . . . at . . .

Hydraulics Unlimited Mfg. Co.



Bardons & Oliver, Inc.
1133 West 9th Street
Cleveland, Ohio

Gentlemen:

Based on the performance of our first No. 7, 4½" capacity Bardons & Oliver Turret Lathe, we have, as you know, purchased a second No. 7. These two new machines have greatly increased our production and lowered our operational cost. We were able to eliminate four other machines and combine twelve operations. Our handling costs were also lowered since operations were previously done in different places in the plant.

Very truly yours,

Hydraulics Unlimited Mfg. Co.

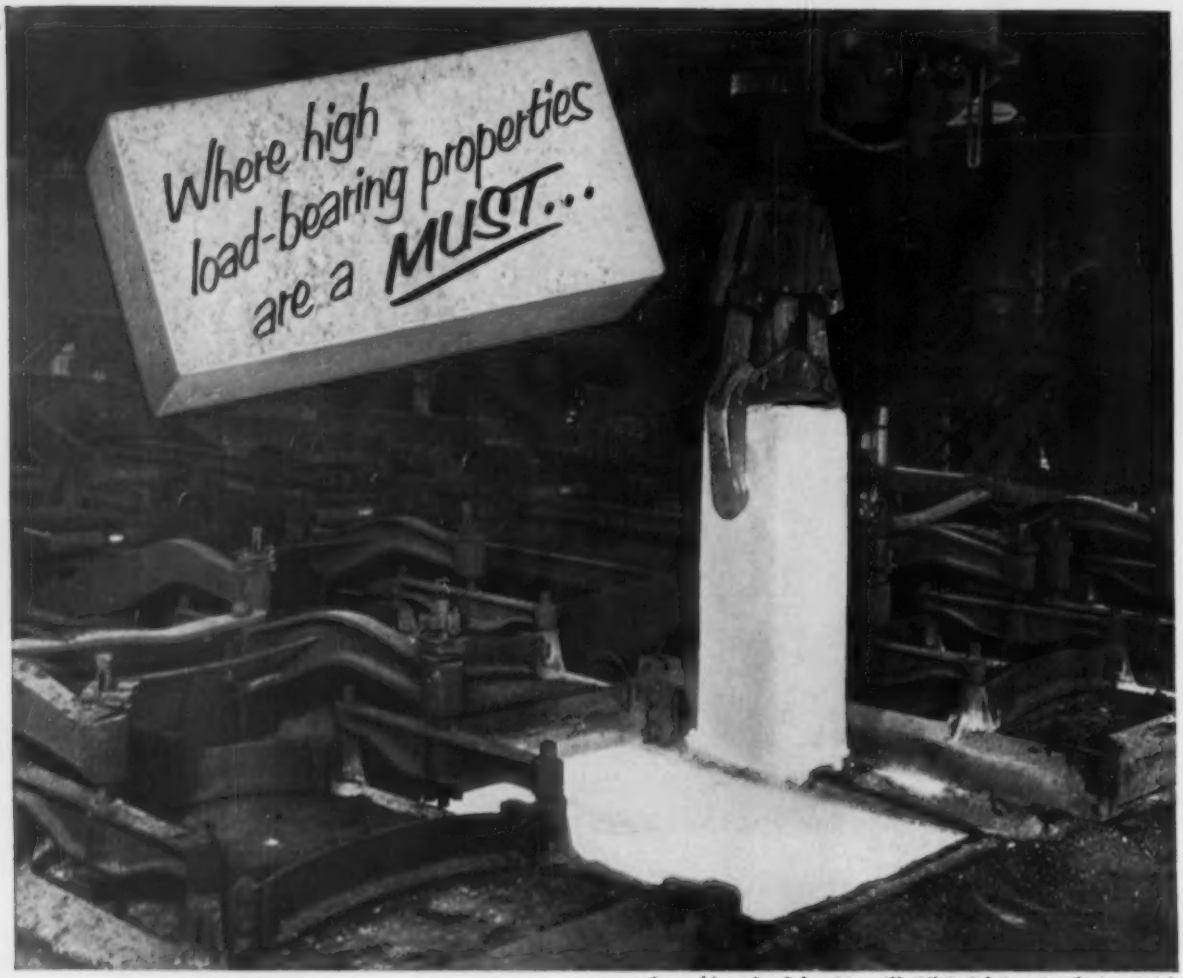
L. W. Harsh

L. W. Harsh, President

MANUFACTURERS OF TURRET LATHES AND CUTTING-OFF LATHES

BARDONS & OLIVER, INC.

1136 WEST 9TH STREET • CLEVELAND 13, OHIO



In soaking pits, Johns-Manville Sil-O-Cel C-22 Insulating Brick provide outstanding performance as back-up insulation.

Specify

Johns-Manville SIL-O-CEL C-22 Insulating Brick

the diatomaceous silica brick that retains its high cold crushing strength of 700 psi throughout normal service range

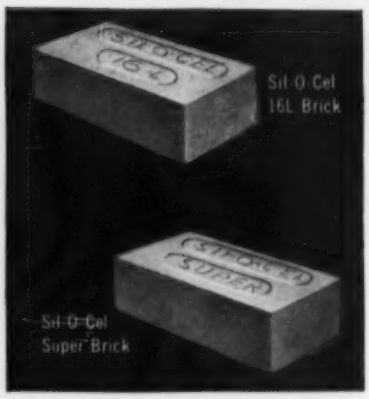
Because of its exceptional strength Sil-O-Cel C-22 Insulating Brick has gained wide acceptance as an all-purpose insulating brick. It is especially recommended for soaking pits, open hearth bottoms, slab heating furnaces, hot blast stoves, coke ovens and other high temperature equipment.

Millions of microscopic cells provide Sil-O-Cel C-22 brick with excellent heat resistance up to 2000F. It has a thermal conductivity of only 1.88 Btu in/sq ft/F/hr at 1000F mean temperature. In addition, with a density of 38 lb/cu ft, it is light and easy to handle.

For direct exposure or back-up to 1600F, use Sil-O-Cel 16L Insulating Brick. This newest member of the J-M diatomaceous silica insulating brick family has *less than 0.1% reversible thermal expansion at 1600F.* Conductivity is 1.07 Btu in/sq ft/F/hr at 1000F mean temperature with a density of 33-35 lb/cu ft. Cold crushing strength is 350 psi. Sil-O-Cel 16L serves equally well as back-up insulation or exposed refractory lining.

For back-up at higher temperatures, specify Sil-O-Cel® Super Insulating Brick with an unusually high temperature limit of 2500F.

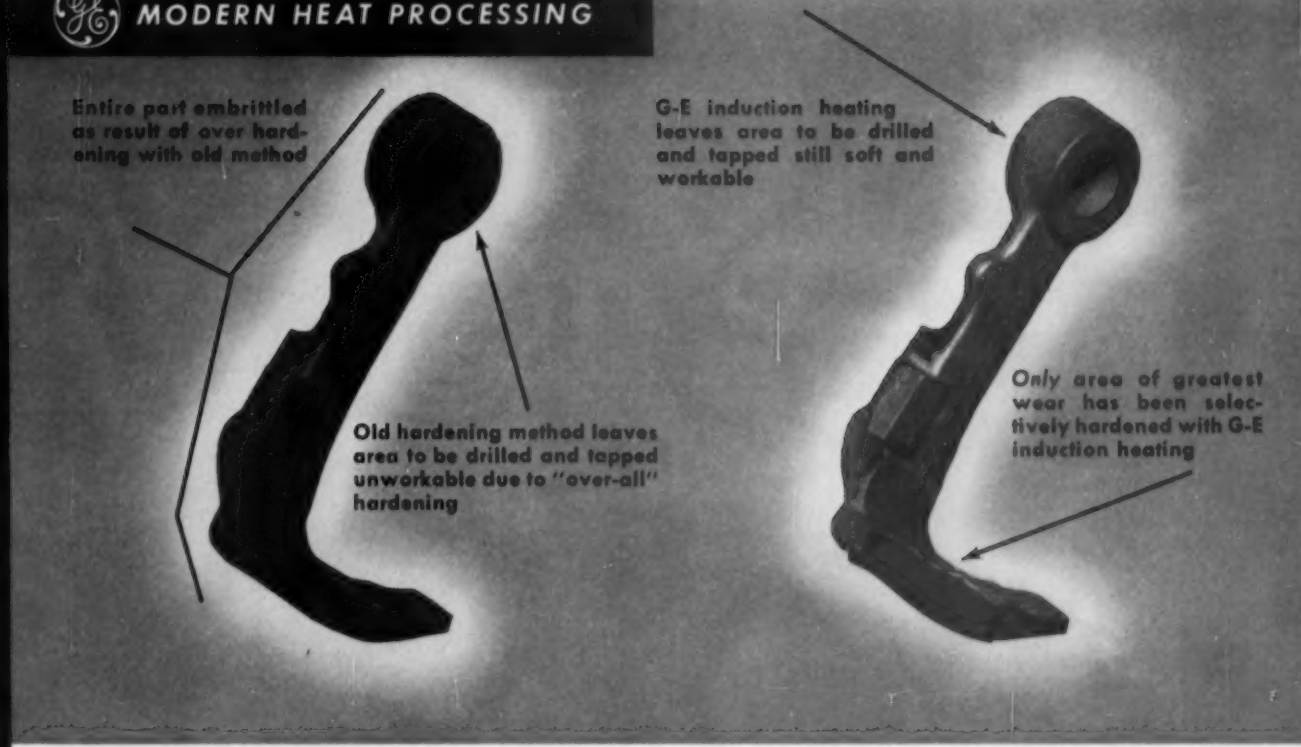
Write today for further information on Sil-O-Cel Insulating Brick and Insulating Fire Brick. Ask for Brochure IN-115A. Address Johns-Manville, Box 60, New York 16, N. Y. In Canada, 565 Lakeshore Road East, Port Credit, Ontario.



Johns-Manville *first-in* **INSULATION**

MATERIALS · ENGINEERING · APPLICATION

MODERN HEAT PROCESSING


Entire part embrittled as result of over hardening with old method
Old hardening method leaves area to be drilled and tapped unworkable due to "over-all" hardening
G-E induction heating leaves area to be drilled and tapped still soft and workable
Only area of greatest wear has been selectively hardened with G-E induction heating

PROBLEM:

Chill-cast rejects at Draper Corporation due to (1) Embrittlement (2) Over-all hardening

SOLUTION:

G-E Induction Heater Cuts Rejects 95% By Pinpoint Hardening Cast-iron Parts

The East Spartanburg, S. C. division of Draper Corporation was having difficulty controlling the hardening of cast-iron parts. Their old chill-cast hardening method forced them to reject many of the parts, which were overhardened and brittle. In addition, they had no way of controlling the size of the area to be hardened. This made drilling and tapping operations difficult—and frequently impossible.

SINCE INSTALLING A 20-KW G-E induction heater in their production line, they are able to cast the parts, drill and tap them while the cast iron is still soft, and then selectively harden only the area of greatest wear. This "pinpoint" hardening reduces the heated area of the parts by 70–90%. As a result, rejects have been cut 95%, costs are reduced, and the Draper Corporation is producing a product of uniform high quality.

THE COMPLETE SATISFACTION of Draper Corporation with their General Electric induction heating equipment was expressed by Mr. Fred Burgess, Plant Engineer: "Our G-E induction heater has been in operation for over five years. During that time we have greatly reduced manufacturing costs because of our decreased scrap losses and increased production. Maintenance of the heater hasn't been any problem, either. We just couldn't ask for any better service than we've had from our G-E equipment."

GENERAL ELECTRIC

WATCH FOR ANNOUNCEMENT

of General Electric's complete NEW line of electronic induction heaters

For application assistance, contact your nearest G-E Apparatus Sales Office or send coupon for free bulletin GEA-4945.

General Electric Company
Apparatus Sales Division, Section G722-2
Schenectady 5, New York

Name.....

Position.....

Company.....

City..... **State**.....

GIANT SIZE!

THE GIANT SIZE **Sellers Floor Type Horizontal has:**

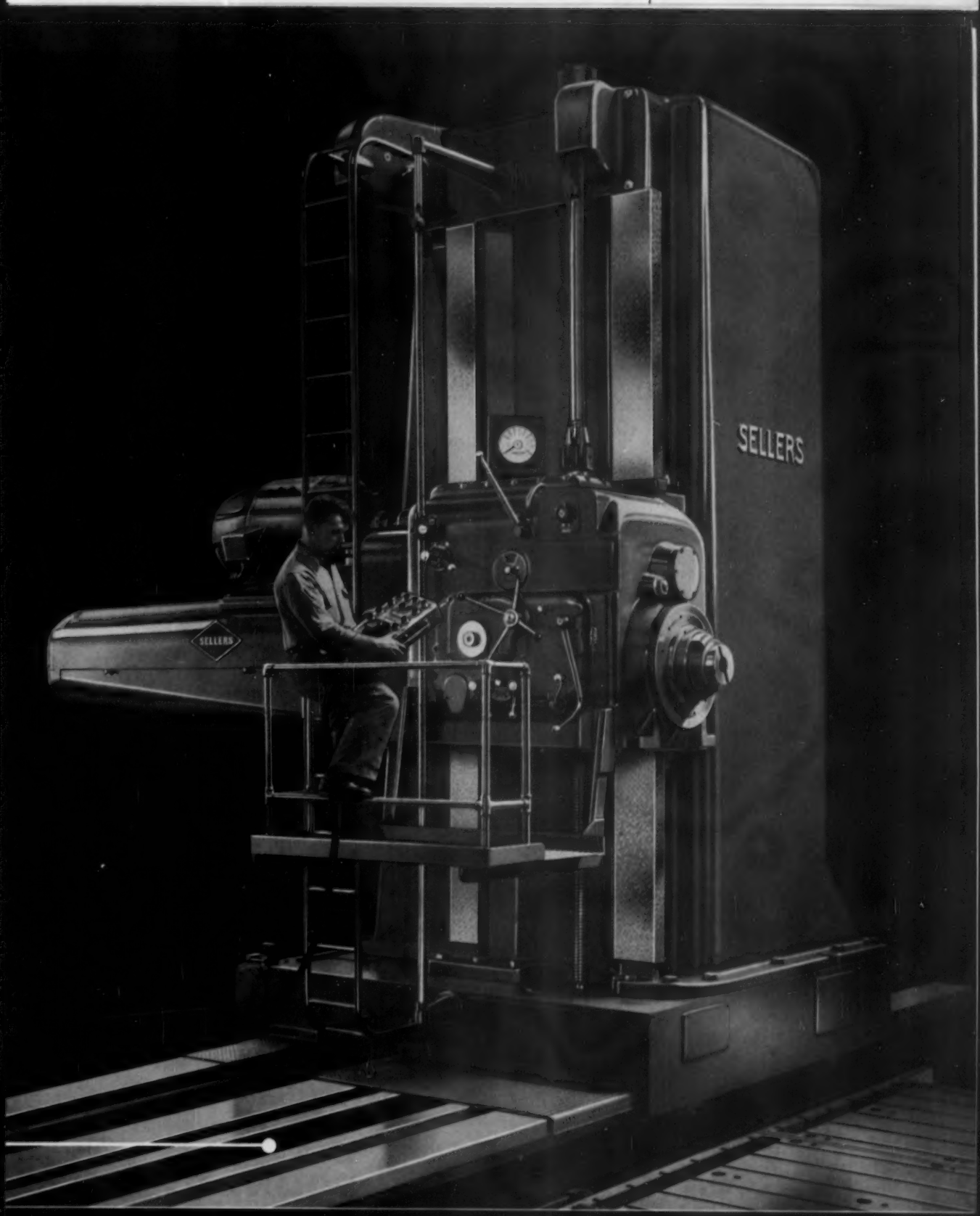
A 10 inch diameter spindle
An 8 foot spindle feeding stroke
A runway that measures 9 feet across the ways
A column that measures 4½ feet across its ways
Up to 15 feet of head travel on the column
A 100 horsepower driving motor

It is a big machine for big work, but with its electronic push-button control, it handles like a small one.

CONSOLIDATED MACHINE TOOLS FJB

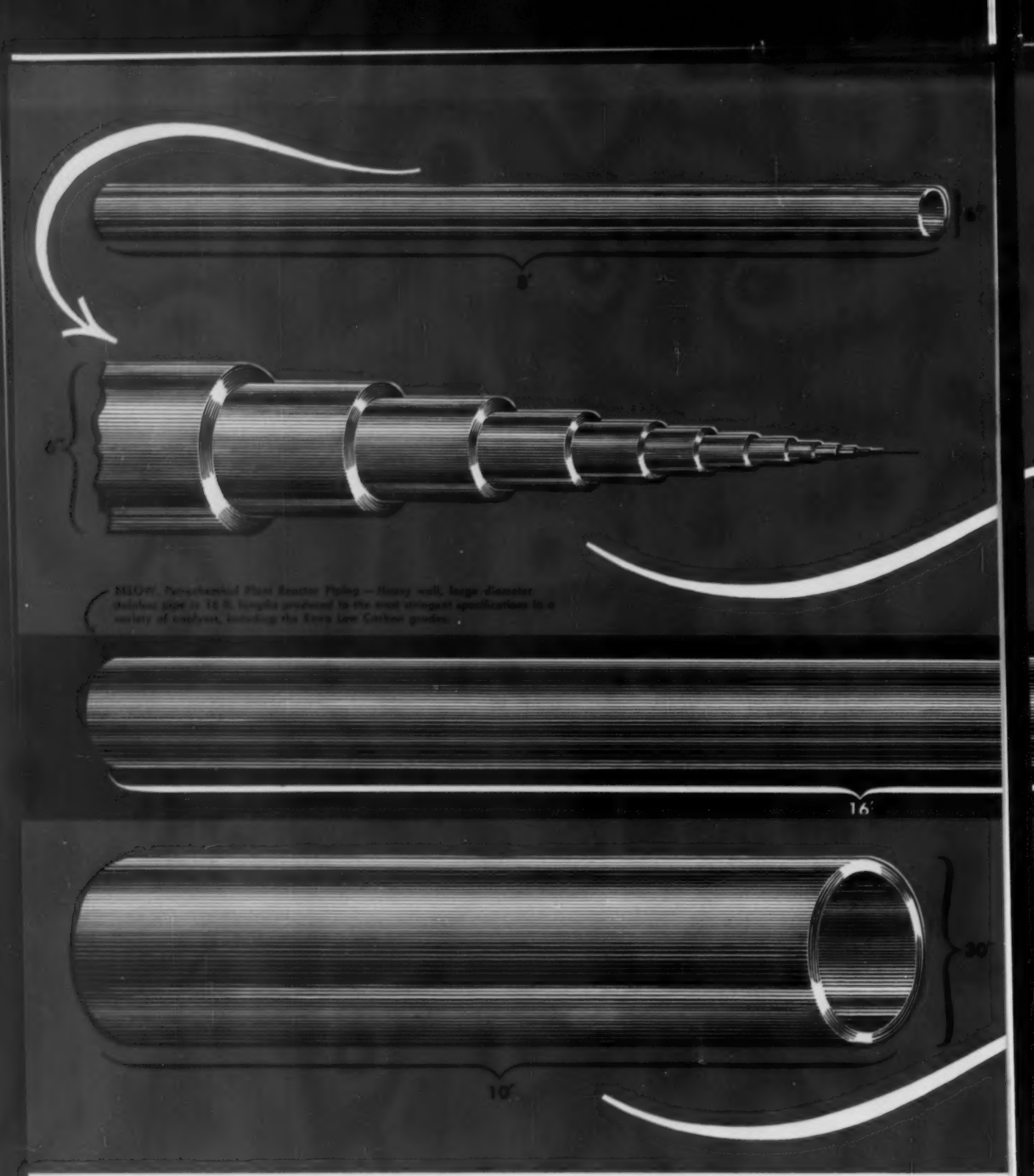
CONSOLIDATED MACHINE

A DIVISION OF FARREL-



TOOL COMPANY ROCHESTER 10, NEW YORK

BIRMINGHAM CO., INC.



BELOW: Petrochemical Plant Reactor Piping — Heavy wall, large diameter stainless pipe in 16 ft. lengths produced to the most stringent specifications to a variety of customers, including the Extra Low Carbon grades.

UNITED STATES PIPE & FOUNDRY CO.

Special Products Division

BURLINGTON, NEW JERSEY

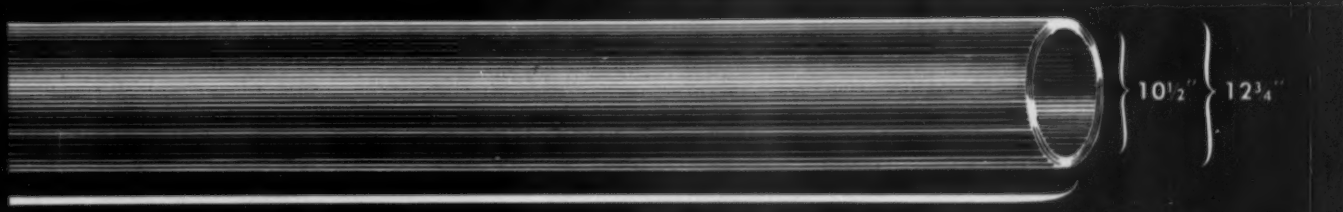
SALES OFFICES: LOS ANGELES, SAN FRANCISCO, CHICAGO, ST. LOUIS, CLEVELAND, DETROIT, PITTSBURGH, HARTFORD, BURLINGTON

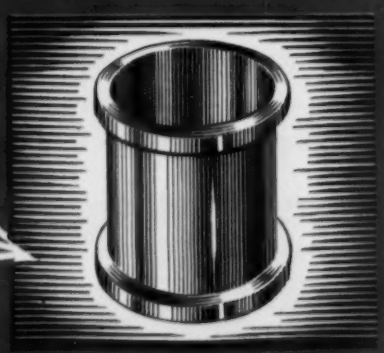
3 PROBLEMS
each different
1 SOLUTION...
stainless steel
Centrifugal Castings

Hollow Billets for cold reducing into small diameter seamless tubing, even down to hypodermic needles—ultimate proof of metal soundness! Many so-called non-piercable grades of pipe and tubing can be hot or cold reduced from centrifugally cast billets.

Heavy Wall stainless steel pipe, centrifuge bowls, hollow billets for finely drawn hypodermic needle tubing . . .

These are among the many end uses for metal mold centrifugally cast cylindrical shapes. They are typical of the exacting, difficult service conditions to which this product is subjected. All three examples shown demonstrate the fundamental versatility of this manufacturing process—unequaled product soundness—from hypodermic needle stock subjected to the repeated stresses of cold reduction, to the centrifuge bowl spun





Centrifuge Bowl Shells produced from multiple length sections and machined to shape desired.

at 1800 RPM, to the petrochemical plant reactor piping that must pass hydrostatic pressure tests equal to 90% of the Yield Strength of the metal. These are the proving grounds of quality—of the ability to meet even the most exacting of product specifications.

We welcome your inquiries. For descriptive literature on the versatile metal mold process, write to United States Pipe and Foundry Company, Special Products Division, Burlington, N. J.

Study these advantages for your cylindrically-shaped products

- **Reduced processing time and increased production.**
- **Design of parts to suit the specific job requirements by selecting the correct alloy—not the next best available alternate.**
- **Conservation of expensive metals and alloys—especially on tubular parts now produced from solid sections.**

SIZE RANGE AND COMPOSITION FLEXIBILITY

Outside Diameter—4" to 36"

Wall Thickness—⅜" and up

Length—Up to 16' in the "as-cast" condition

Types of Stainless Cast—All Standard AISI and ACI grades of ferritic and austenitic stainless, including No. 20 Alloy, 17-4 P H, 17-7 P H and E.L.C. grades.

Is there such a thing as...

A PRACTICAL REPLACEMENT PROGRAM?

YES! – and Jones & Lamson can help you develop it

Industry unanimously endorses the idea of planned replacement of capital equipment. Nevertheless, most of America's machine tools are more than 10 years old, sadly inferior to today's profit-producing equipment. The idea is sound — but action is lacking.

Biggest reason for this paradox is financial. Until recently, replacement required a substantial outlay of capital. In many cases, needed capital was lacking; in others, the capital, though available, had many other calls upon it. Unrealistically low depreciation allowances on capital equipment served as an added deterrent to replacement.

The picture has changed. Now, provisions of our new tax laws permit more equitable write-offs, and make replacement a more attractive proposition.

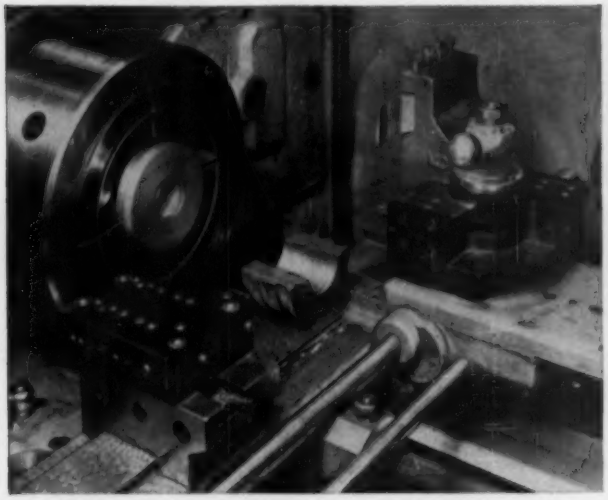
Jones & Lamson makes replacement even *more* feasible, by clearing away the traditional difficulties of financing with its unique Procurement Plans.

This, then, is what Jones & Lamson offers: modern machine tools that can greatly improve your production; *plus* your choice of several sound, low-cost (interest rates of 3¼%, and lower, add-on) methods of procuring these tools.

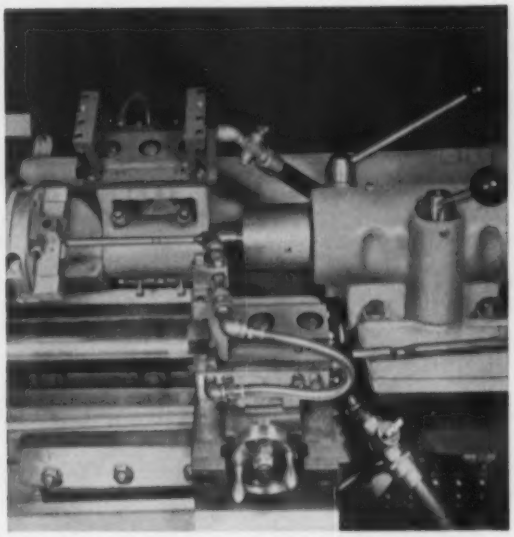
◀ **OBSOLETE** machine tools like these hamper industrial growth, keep production low, and costs high.

RESEARCH in machining methods, metallurgy, tool geometry, is carried on continually by J & L. Important findings have resulted in the incorporation of unique engineering features in J & L machines.

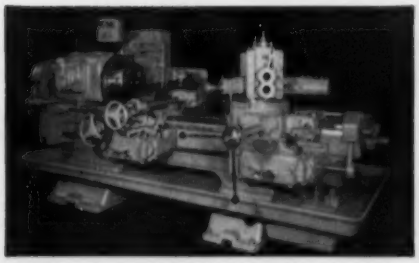
No. 20 Alloy, 17-4 P H, 17-7 P H and E.L.C. grades.



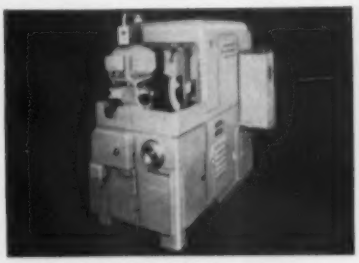
IMPROVED production on this difficult machining job was made possible by J & L engineers' close co-operation with the customer. Research testing, and incorporation of special features on a J & L turret lathe cut time-per-piece on this bottle neck-ring from 14 to 5½ min., increased production 120%!



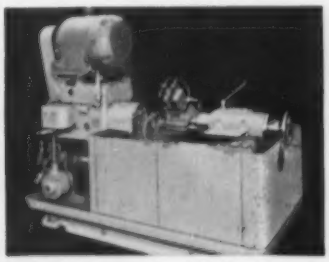
AUTOMATIC OPERATION. One Fay Automatic Lathe replaced eight engine lathes formerly used on this job — and substantially increased production of sewing machine crankshafts at the same time.



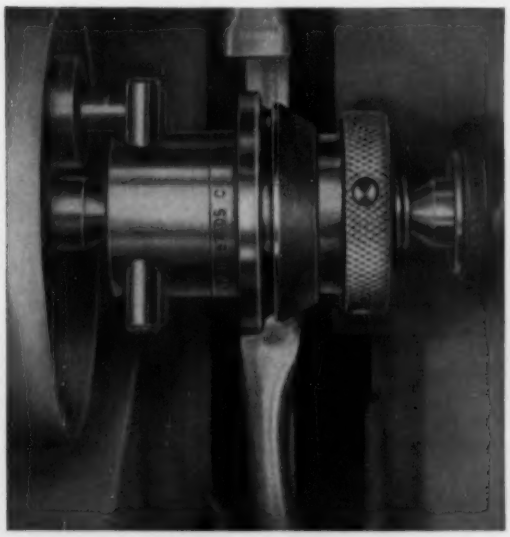
Universal Turret Lathes



Automatic Thread & Form Grinders



Fay Automatic Lathes



GRINDING. This J & L Model "E" Form Grinder, used in producing seaming rolls for the canning industry, completely eliminated a roughing operation, increased production by 100%.

JONES & LAMSON

MACHINE J&L COMPANY

511 Clinton St., Springfield, Vt., U. S. A.

Universal Turret Lathes • Fay Automatic Lathes • Automatic Thread & Form Grinders
Optical Comparators • Automatic Opening Threading Dies & Chasers
Automatic Double-End Milling & Centering Machines

Send today for complete details on J & L's machines, methods and Procurement Plans. Simply fill in the coupon below, clip it to your letterhead *and mail. We'll do the rest.*

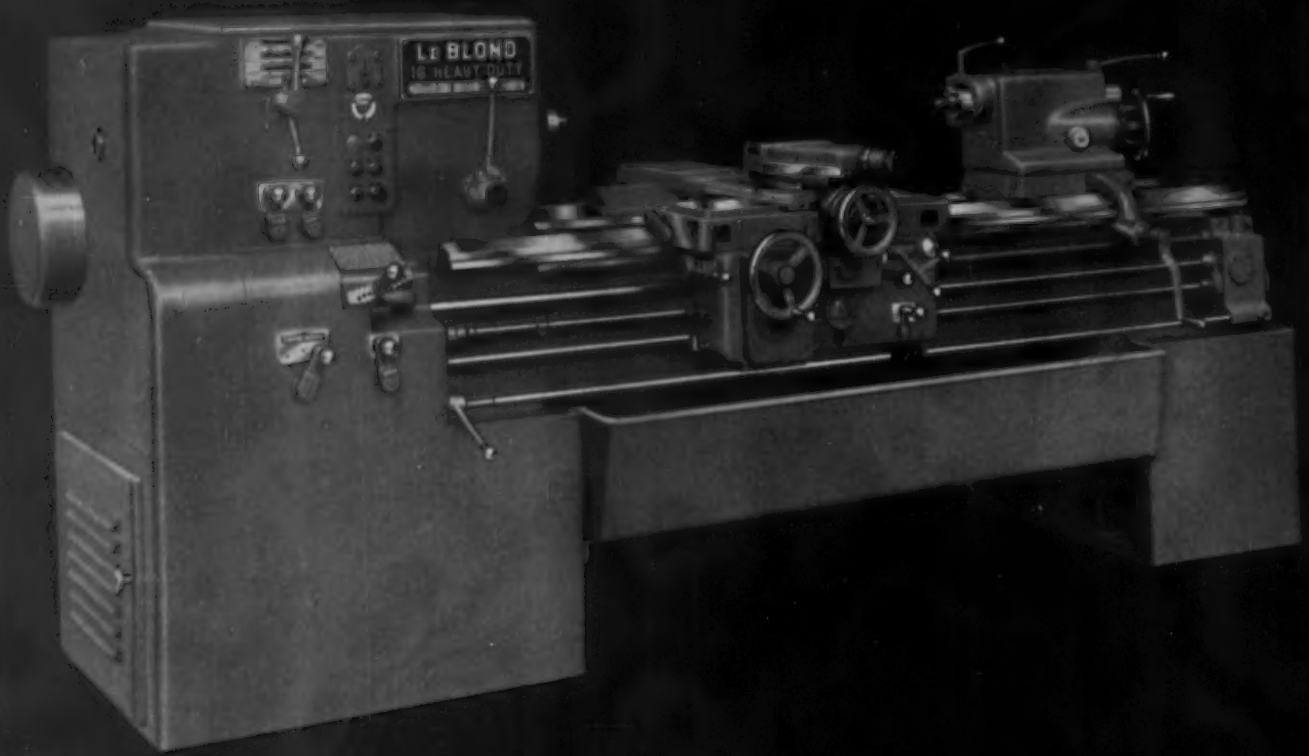
JONES & LAMSON MACHINE COMPANY
511 Clinton St., Springfield, Vt., U. S. A.

GENTLEMEN:
Please send me the J & L Machine Tool Replacement Information Kit.

Name.....

Title.....

cut with confidence . . . **HERE'S THE**



New LeBlond 16" H.D. Heavy-Duty Lathe

NEW LeBLOND

16" HEAVY DUTY

stamina plus with precision

LeBlond heavy-duty engine lathes have always been known for their outstanding stamina—the inherent ability to stand up to the toughest turning jobs with precision, year after year. Our new 16" Heavy Duty is the most rugged, yet precise machine of its class that we've ever built!

The new headstock uses our proven combination gear-belt drive to give you a complete range of 27 spindle speeds from 16 to 2000 rpm chosen by direct-reading color plate. You get maximum power and smoothness from the 20-hp motor whether you're roughing or finishing—18 speeds are gear driven; 9 higher speeds are driven through a positive Gilmer-type belt that requires no adjustment. Free-running spur gear design assures minimum no-load friction horsepower . . . shafts and gears not needed for a given speed remain idle, do not consume power uselessly.

For a new degree of speed and convenience, a single lever controls the four-way power rapid traverse built into the apron. Both length and cross feed through a positive-jaw clutch are controlled by a single lever. Lubrication is entirely automatic. Bedways are hardened and ground steel inserts fitted to LeBlond's compensating veeway principle for better distribution of cutting forces. Quick-change box is totally enclosed. New tailstock uses the exclusive LeBlond thrust-lock design with a quick-set length dial.

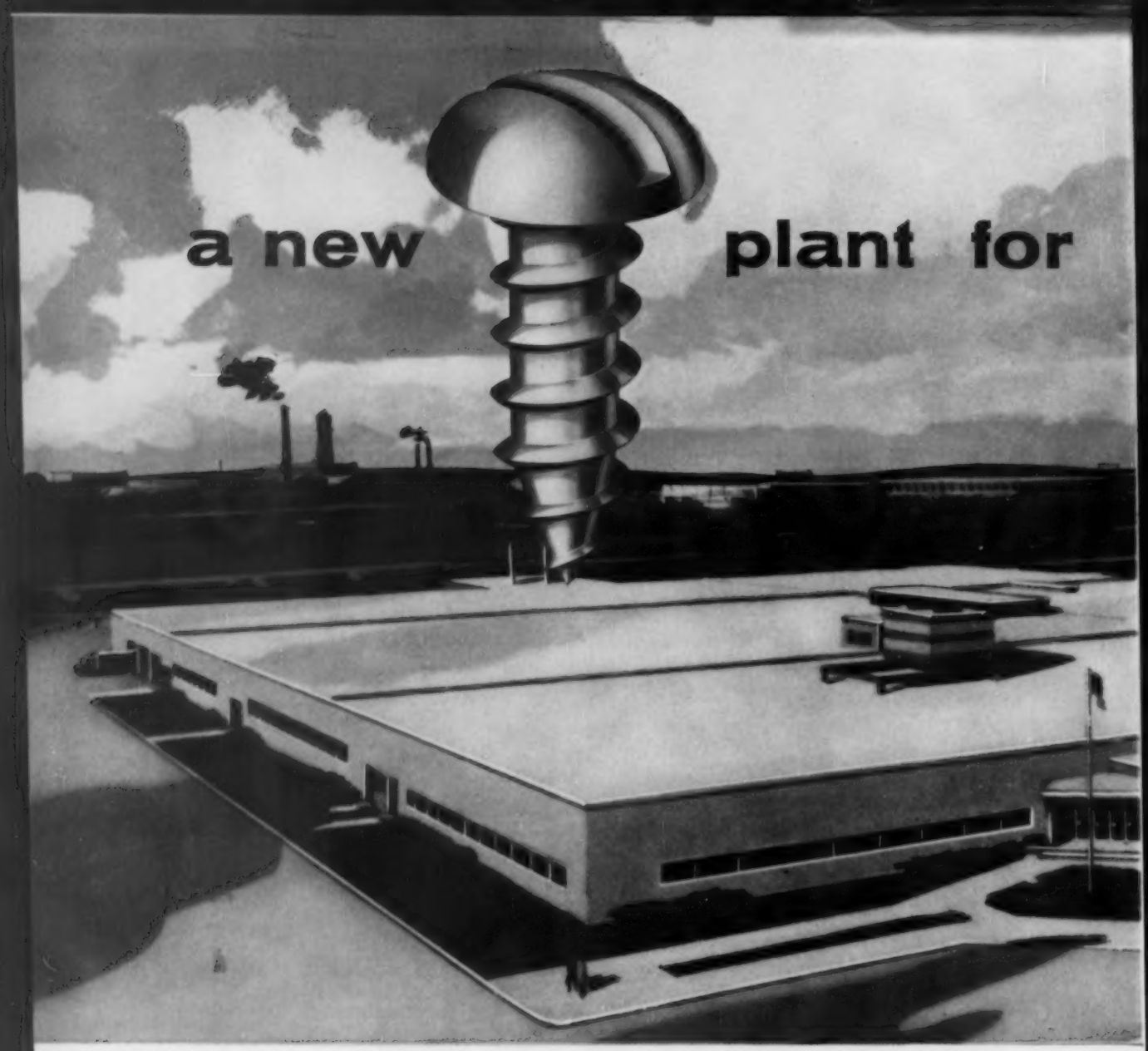
For consistent and precise production, you can't do better than the new LeBlond 16" Heavy Duty. Call your nearby LeBlond Distributor or write for Bulletin HD-126C.

. . . cut with confidence

THE R. K. LEBLOND MACHINE TOOL COMPANY
CINCINNATI 8, OHIO

LeBLOND *of Cincinnati*

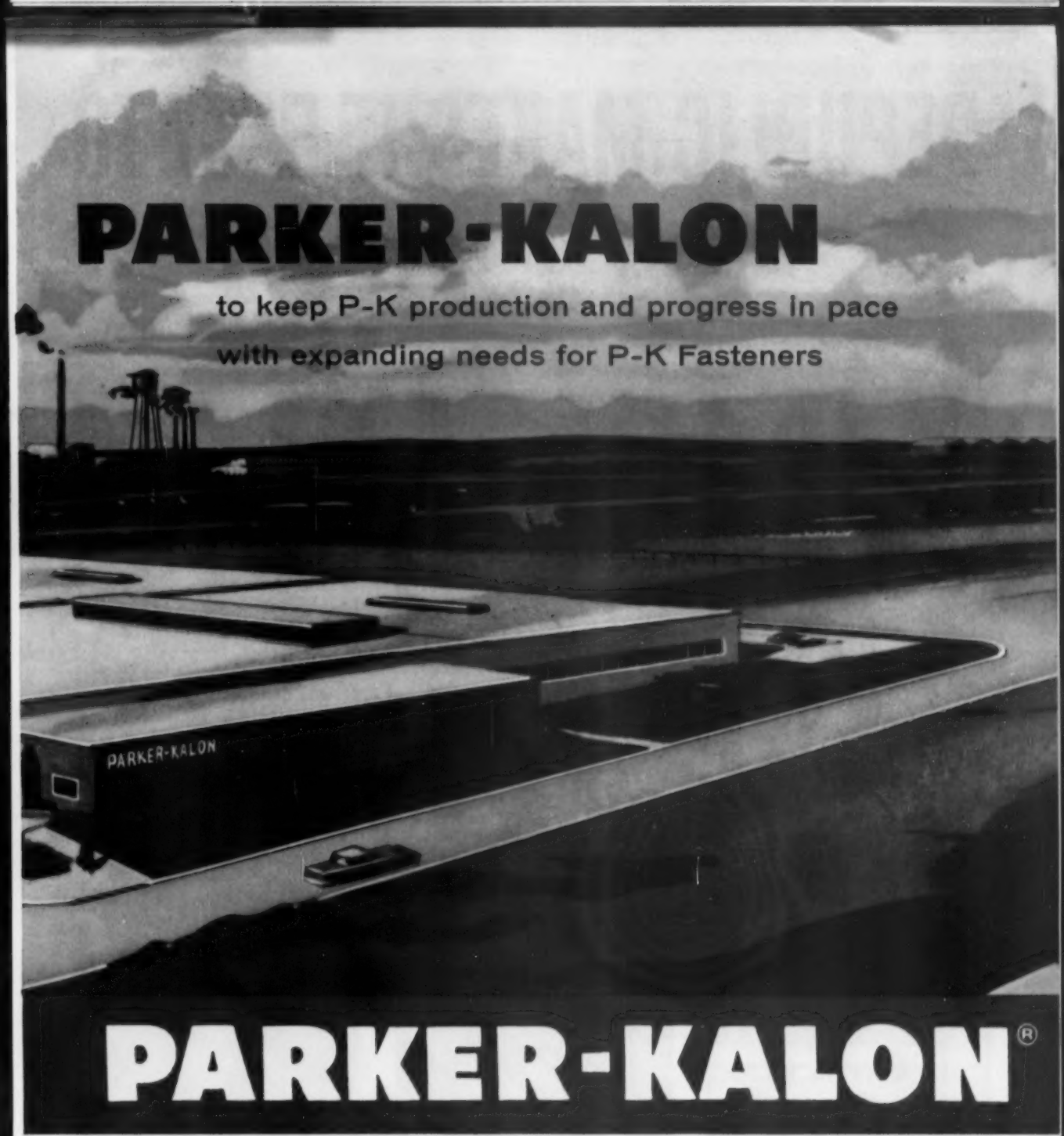
WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • *FOR MORE THAN 68 YEARS*



In a few weeks, Parker-Kalon will move to its new plant in Clifton, New Jersey (about 10 miles from New York City). This modern building, containing 267,000 square feet on one floor, is one of the largest plants devoted exclusively to the manufacture of fasteners.

It is planned for the highest efficiency and economy in all operations, with production keyed to the steadily increasing demand for P-K Fasteners throughout industry. Advanced facilities for engineering and research will accelerate P-K progress in development of new and improved fasteners.

Now, more than ever, you can be sure . . . "If it's P-K . . . it's O.K.!"



PARKER-KALON DIVISION • General American Transportation Corporation, Clifton, New Jersey

SELF-TAPPING SCREWS • STAPS • SOCKET SCREWS • SCREWNAILS • MASONRY NAILS • WING NUTS • THUMB SCREWS

Sold through leading Industrial Distributors.

REPUBLIC MAKES IT EASY TO

One call to your Republic Bolt and Nut Distributor gets all the fasteners you need for assembly and maintenance work. There's no shopping around to get the types and sizes you need. There's no time lost. Paper work is reduced. One order, one invoice, one shipment covers everything.

And even though your distributor might be temporarily out of a particular item you require, he can get it for you in a hurry. Republic's Bolt and Nut Division backs him with one of industry's largest stocks of headed and threaded products. More than 20,000 standard types and sizes of fasteners are made and stocked by Republic. Everything from machine bolts, cap screws, hot and cold punched nuts to rivets, track bolts, alloy studs, sheet metal screws.

In addition, Republic produces over 8,000 special types and sizes of fasteners—like "Nylok" Nuts, high-strength bolts, mine roof bolts.

You're getting quality in every sense of the word when you buy Republic Fasteners. Republic controls quality at every stage of production—from raw materials to finished fastener. Republic uses its own ore, makes its own steel (over 50 analyses of carbon, alloy and stainless), employs the most modern machines and procedures.

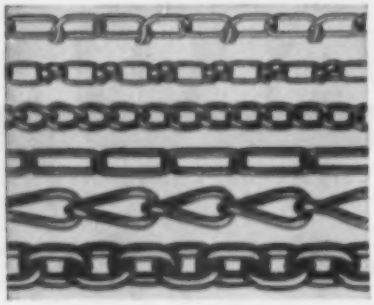
You can depend on Republic Fasteners for uniformity, ease of application, long service life, quality. Quick delivery, too.

Contact your industrial distributor. Or mail the coupon for additional information.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

Republic also makes it easy to get...



CHAIN FOR EVERY INDUSTRIAL REQUIREMENT. Republic's Round Chain Division offers a complete line of welded and weldless chain, chain slings—plus every type of fitting, attachment and accessory. Strategic location of Republic Chain plants and warehouses assures you of prompt delivery through your Republic Distributor.

COLD FINISHED STEEL BARS AND SHAFTING for steel parts production. Republic's Union Drawn Division, leading producer of cold drawn steels, supplies rounds, squares, hexes, flats, special sections and precision shafting in all standard and special carbon, alloy and stainless analyses. Your Union Drawn Distributor will deliver one foot, one bar or a truckload.

MATERIALS HANDLING EQUIPMENT to meet your specific requirements. The PB-120-T Box and Skid Units, shown above, are only one of many types manufactured by Republic's Pressed Steel Division. They can be adapted to the needs of any industry. Republic Materials Handling Equipment is sold through dealers located in principal cities from coast to coast.

GET THE FASTENERS YOU NEED

REPUBLIC STEEL CORPORATION
3104 East 45th Street,
Cleveland 27, Ohio

REPUBLIC STEEL

Please send more information on:

- ☐ Fasteners
- ☐ Cold Finished Bars and Shafting
- ☐ Chain
- ☐ Materials Handling Equipment

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

E-5648

TAPER-LOCK

A PATENTED PRODUCT OF DODGE

—OFF THE SHELF

NO REBORING!
NO KEYSEATING!
NO MACHINING!

Ready for the shaft, with no costly, time-consuming operations to make them fit. That's the big news about Dodge Taper-Lock Sprockets. Taper-Lock grips the shaft with the firmness of a shrunk-on fit, yet comes off easily. Bushings may be re-used. They come in sizes to meet most every application.

Taper-Lock Sprockets are available from Distributors' stocks in a complete range of B-type steel sprockets —½" to 2" pitch. Dodge quality Roller Chain is packaged in 10-foot lengths—also available in 50-foot and 100-foot reels. Save time—save money—keep production rolling—get Dodge Taper-Lock Sprockets and Roller Chain from your Dodge Distributor.

DODGE MANUFACTURING CORPORATION, 800 Union St., Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor, for valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

THERE'S ONLY ONE TAPER-LOCK, THE BUSHING THAT MOUNTS FLUSH!

Standardize, economize with Taper-Lock, the bushing that is interchangeable in Dodge sprockets, sheaves, couplings and conveyor pulleys. *More than 2,000,000 in use!*

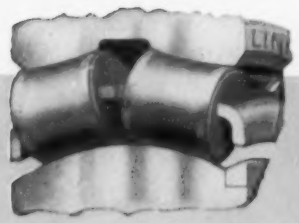
DODGE

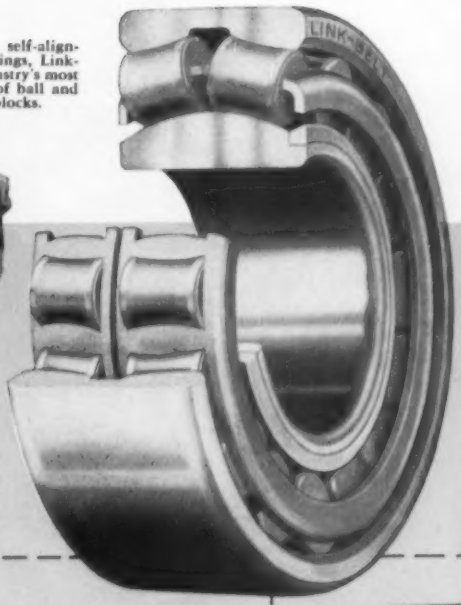
of Mishawaka, Ind.

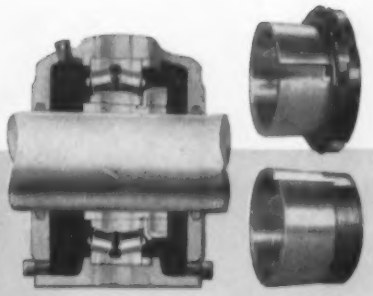
For tough, heavy-duty applications...make use of these important

bearing differences

In addition to self-aligning roller bearings, Link-Belt makes industry's most complete line of ball and roller bearing blocks.





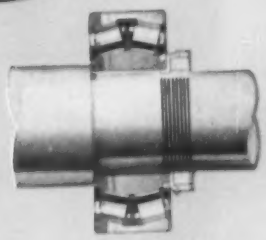


FREE ROLLING—SELF-ALIGNING. Rollers are naturally positioned by their concave shape. Design assures true rolling under all conditions. Spherical inner ring can be aligned in any direction without affecting load capacity.

EASY INSTALLATION and removal of adapter type bearings are provided by the tapered fit of bearing on adapter sleeve which is readily adaptable to commercial shafting tolerances. Locknut draws sleeve tightly around shaft for positive, concentric mounting. Lockwasher holds locknut in place.

LOCKED-IN CLEARANCE. Selective assembly of rollers and raceways with accurately formed hardened steel retainers assures proper operating clearance, guidance and spacing of rollers.

Rollers are completely pocketed in retainers for accurate spacing and guiding.



SMOOTH OPERATION, LONG LIFE are advantages of the straight bore type mounting, which assures maximum concentricity of inner ring with shaft. Especially desirable when minimum radial run-out is essential.

They're all present only in LINK-BELT self-aligning roller bearings

SUBTLE differences in bearings can make notable differences in the life and efficiency of your equipment. Take Link-Belt self-aligning roller bearings, for example. Their "self-contained" feature permits the bearing to float axially in the mounting, when desired, compensating for shaft expansion or settling of bearing supports . . . preventing extraneous thrust loads from being set up between bearings on the same shaft. What's more, inherent self-aligning design and preadjustment preclude use of expensive or cumbersome self-aligning housings.

Ask your nearest Link-Belt office or authorized stock-carrying distributor for Book 2196 on self-aligning roller bearings and Book 2550, containing full data on all Link-Belt ball and roller bearings.

LINK-BELT

Ball and Roller Bearings

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 10,711-A

MOTOR FACTS ON INDUSTRY'S
MOST PREFERRED "POWER PACKAGE"

Electrical System Fact—Only the new Life-Line "A" motor gives you the unsurpassed corrosion-resistant protection of exclusive new Bondar, Bondite and Mylar* insulations.

*Du Pont Registered Trade-Mark

FACT:

The new Life-Line A is the most corrosion-resistant motor on the market

The corrosive action of chemicals takes a heavy toll on conventional motors. The new Westinghouse Life-Line® "A" motor offers more protection against corrosive atmospheres than any other motor you can buy. How?

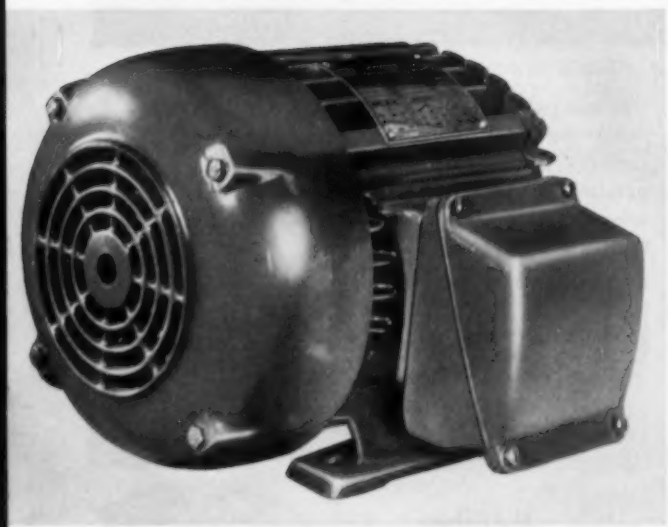
Because the combined improvements in insulation, housing and bearing design give unsurpassed protection against any contamination. It takes the right combination of such improvements in *all three systems*—electrical, mechanical and lubrication—to make the Life-Line "A" industry's most preferred power package.

Get all the facts by calling your Westinghouse sales engineer . . . *The Man With The Facts.*

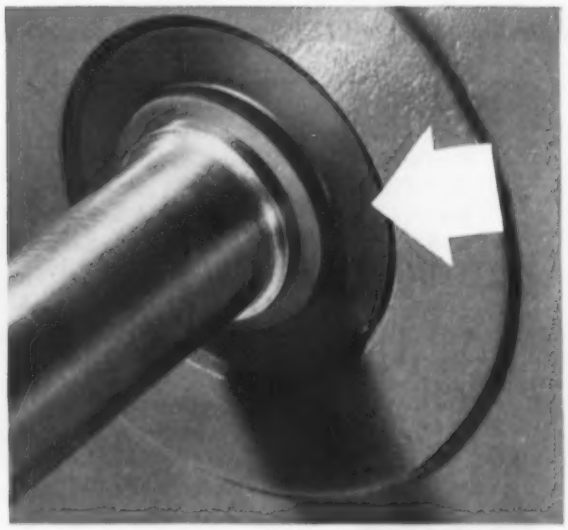
J-21881

YOU CAN BE SURE . . . IF IT'S

Westinghouse



Mechanical System Fact—New cast-iron frames and brackets utilize the finest grained castings with uniformly thick wall sections precisely fitted and sealed. Molded glass plastic cooling fans on totally-enclosed types are chemically inert.



Lubrication System Fact—The new pre-lubricated Life-Line "A" bearing features a "4-way seal"—*two* seals on each side. Totally-enclosed types have additional neoprene flinger which assures bearing protection in any corrosive application.

16 surfaces

...on this Garrison Gear Chuck

THE BODY
(soft semi-steel)

THE CONTROL RING
(soft tool steel)

AND THE 6 JAWS
(hard tool steel)

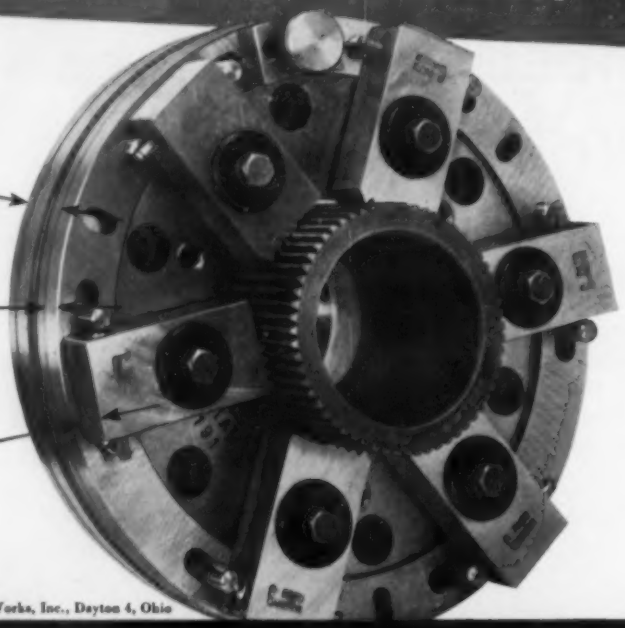


Photo courtesy of Garrison Machine Works, Inc., Dayton 4, Ohio

are Blanchard ground for precision

As every machinist knows, machine tools impart their precision through their chucks. That's why chuck dimensions and tolerances are of critical importance . . . and why Blanchard Surface Grinders are commonly used to produce the flat surfaces required.

Blanchard Surface Grinders are ideal for all kinds of precision grinding jobs. They produce extremely close tolerances for flatness, size and parallelism . . . *at low costs and high production rates.* Many Blanchard users grind surfaces flat to within 2 to 4 light bands, parallel to less than .0001", with dimension tolerance of .0002", and surface finish to better than 3 micro inches.

Whether your work involves precision machining or rapid removal of stock, take the advice of master machinists . . .

PUT IT ON THE BLANCHARD

No. 11 Blanchard Surface Grinder

Send for your free copies of "Work Done on the Blanchard", fourth edition, and "The Art of Blanchard Surface Grinding".

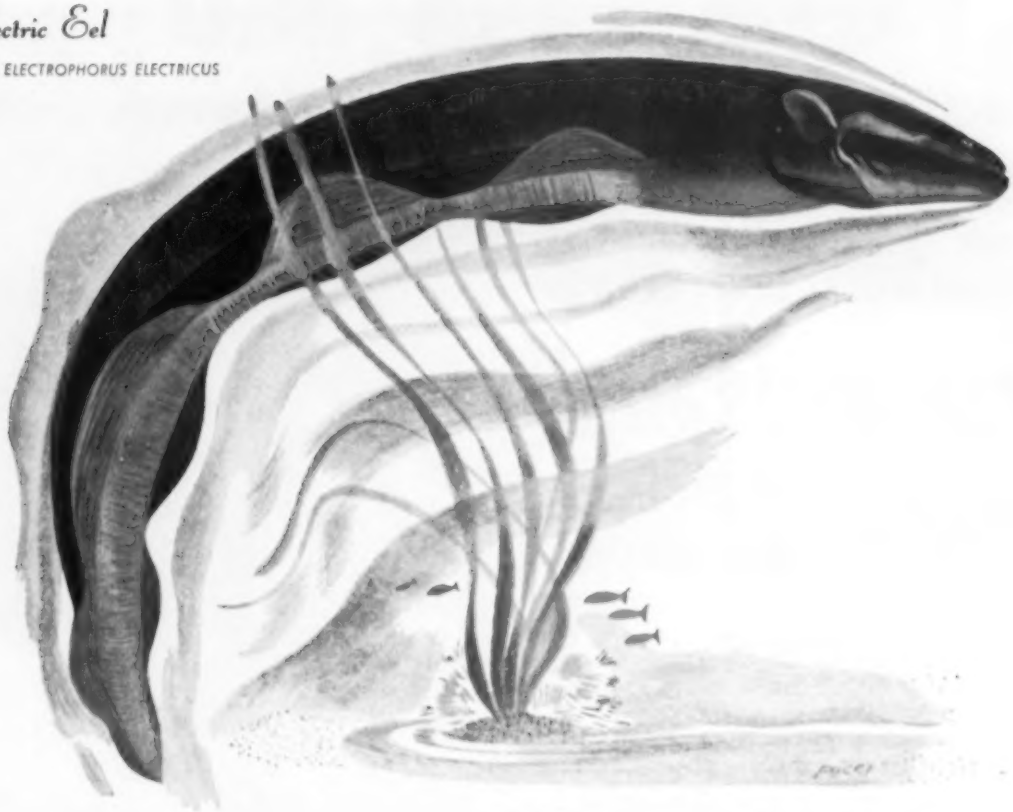
PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY

64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.

Electric Eel

ELECTROPHORUS ELECTRICUS



Electrical Conductivity

Nature has endowed the Electric Eel with the ability to generate and conduct electricity. Under tests, this creature has discharged as much as 550 volts, and 1 ampere of current. That's enough to kill a man.

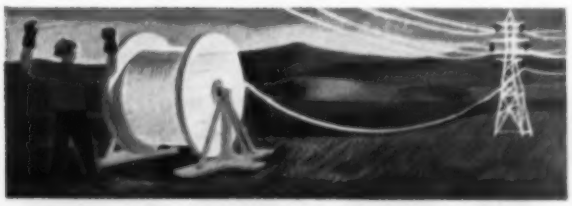
The shock of an Electric Eel is effective for a radius of more than 20 feet. The eel eats fish, frogs and worms which it kills or paralyzes by its electrical discharge.

Aluminum has been endowed by nature with electrical conductivity which is superior to that of most other metals.

Comparing aluminum wire and copper wire of equal electrical resistance, the aluminum wire can carry 112 per cent of the current carried by the copper wire, and the aluminum wire will weigh only half as much. On a volume basis aluminum conductors have about 61 per cent of the conductivity of copper.

Other properties of aluminum of interest to the electrical fabricating industry are: high corrosion-resistance, lower costs of assembly, installation and maintenance.

Aluminium Limited Sales, Inc. is the distributor in the United States for aluminum from Canada. Why not investigate making your products of aluminum?



Electrical Conductivity

Besides being used for high-tension transmission lines and distribution line conductors, aluminum serves the electrical industry in many ways. For instance, it is used in Railroad Electrification, Bus-bars and Fittings, Motor Rotors and Windings, Electric Lamp Bases and Sockets. Aluminum is being used, in the fabrication of electrical items, all the way from the turbine to the toaster.

ALCAN

Aluminum *from* Canada

Aluminium Limited Sales, INC.

630 FIFTH AVENUE • NEW YORK 20, N. Y.

CLEVELAND • CHICAGO • DETROIT • LOS ANGELES • BUENOS AIRES • SÃO PAULO

thousands and thousands and thousands and thousands

OF SKF SY UNIT PILLOW BLOCKS GOING INTO SERVICE

SY Unit Pillow Block

FY Flanged Housing

Aligning Bearing Unit

Because they have the most effective bearing seal ever perfected—the famous SKF Red Seal, made of DuPont "Fairprene"... Because external rotating flingers exclude dirt... Because they are easy to install on standard shafting... Because they are interchangeable with existing installations... Because they are available promptly from distributors' stocks for shaft diameters ¾" to 2 15/16".

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.— *manufacturers of* SKF *and* HESS-BRIGHT® *bearings.*

7618

Order from *authorized* SKF distributors anywhere. The red and white SKF box encloses the finest bearings made.

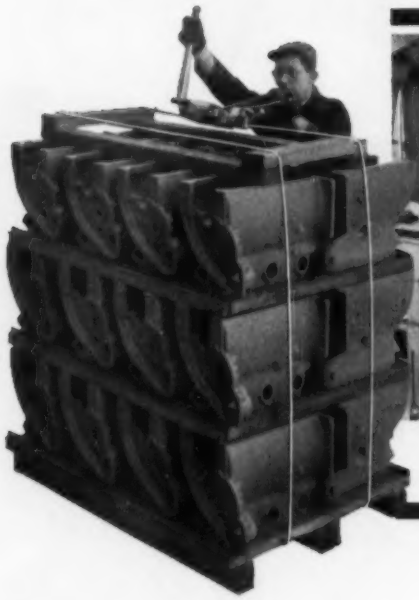
© 1955 SKF Industries, Inc.

SKF®

BEARINGS AND PILLOW BLOCKS

USS GERRARD

ties anything you've ever seen



Assembly-line strapping of cartons of Allis-Chalmers engine parts with USS Gerrard Round Steel Strapping and the Model Q machine.

A tractor packaged for export shipment, being reinforced with a diagonal tie of USS Gerrard Round Steel Strapping.

Allis-Chalmers engine blocks, 24 to a pallet, being reinforced for shipment with USS Gerrard Round Steel Strapping. Pallet weighs 4,000 pounds.

Allis-Chalmers Manufacturing Company, Tractor Works, West Allis, Wis., reinforces packages of all sizes quickly, securely, and inexpensively with USS GERRARD ROUND STEEL STRAPPING

When Allis-Chalmers West Allis, Wis., Tractor Works began packaging replacement parts in cartons to improve its shipping operation, USS Gerrard Round Steel Strapping was chosen as reinforcement. As a result, it provides a neat, inexpensive way to close cartons quickly, protects the product, saves the carton for re-use, and displays the advertising on the box continuously.

Allis-Chalmers is using USS Gerrard Round Steel Strapping to secure packages which vary from 4-inch-square boxes, weighing less than a pound, to huge 38" x 30" x 34½" cartons which weigh up to 3,000 pounds. Even complete tractors are disassembled and crated for export to reduce cubage charges. They, too, are reinforced with USS Gerrard Round Steel Strapping.

Take a tip from a highly successful organization, and try USS Gerrard Steel Strapping — Round or Flat. Whatever your packaging-tying problem might be, our engineers can help you find the safest, most economical solution. Contact us now.

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CHICAGO, ILLINOIS

USS GERRARD STEEL STRAPPING
Round and Flat

UNITED STATES STEEL

SEND FOR THIS NEW BOOKLET NOW

Gerrard Steel Strapping
4711 South Richmond St., Chicago 32, Ill.

Please send me, free of charge, the new 36-page GERRARD Blue Book of Packaging.

Name .....
Company .....
Address .....
City ..... State.....

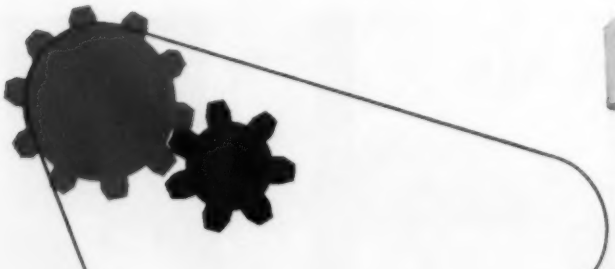
"After we switched to GAS we upped our production improved our product and lowered our costs."

— LITECONTROL

The Litecontrol Corporation in Watertown, Massachusetts, recently installed an overhead Gas oven for baking enamel finishes on lighting fixtures. "This gas conveyor oven saves valuable floor space, operates more economically, and produces a better finished product," says Ralph Sampson, foreman of the operation.

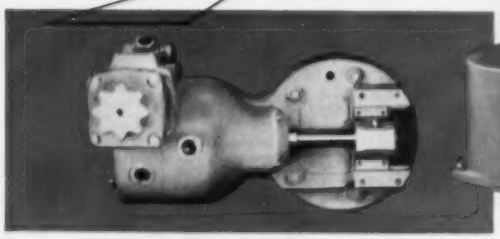
"We also like the controllability of Gas," continues Mr. Sampson. "The precise heats possible with Gas help us make better fixtures of uniform quality."

For further information on how Gas can help you with your process heating operations, call your Gas Company Industrial Specialist. He'll be glad to discuss the economies and results Gas and Modern Gas-fired Industrial Equipment provide. *American Gas Association.*

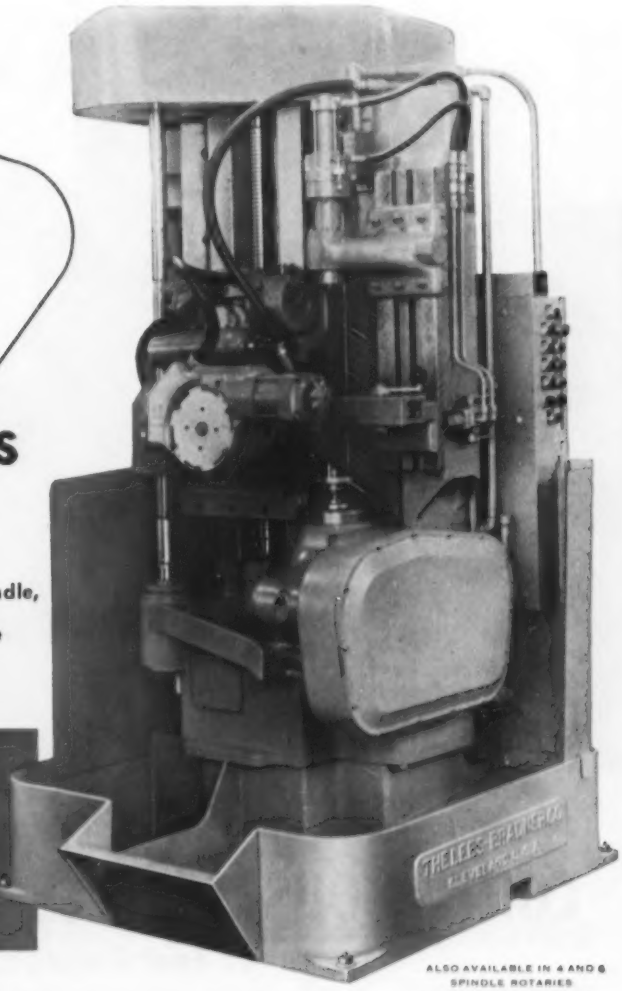


Hob today at tomorrow's speeds

with the new Lees-Bradner Model 7, Type HD Single Spindle, High Speed Hobbing Machine



Close-up shows new, heavier hob head with Timken bearing construction, 3-inch hob shift and new outer support.



ALSO AVAILABLE IN 4 AND 6 SPINDLE ROTARIES

Capacity TODAY to meet tomorrow's production requirements is a built-in bonus feature of Lees-Bradner Hobbing Machines.

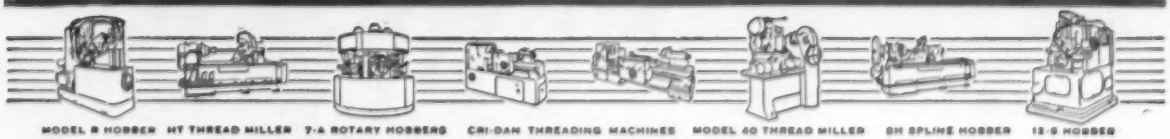
The new Model 7, Type HD Single-Spindle High Speed Hobber for example, is a heavier, faster machine than its prototype. Weighing approximately 1,000 lbs. more, a heavier headstock and heavier column gives you the added rigidity to perform better and faster the excellent job done by its predecessor, the Type "A".

Designed-in production capacity to take care of tomorrow, as well as today, offers savings in time and labor. To industry, constantly pressed for higher production, these savings mean more than dollars. They mean *satisfied customers.*

For the whole story and a demonstration, contact your Lees-Bradner representative. Or, write us direct.

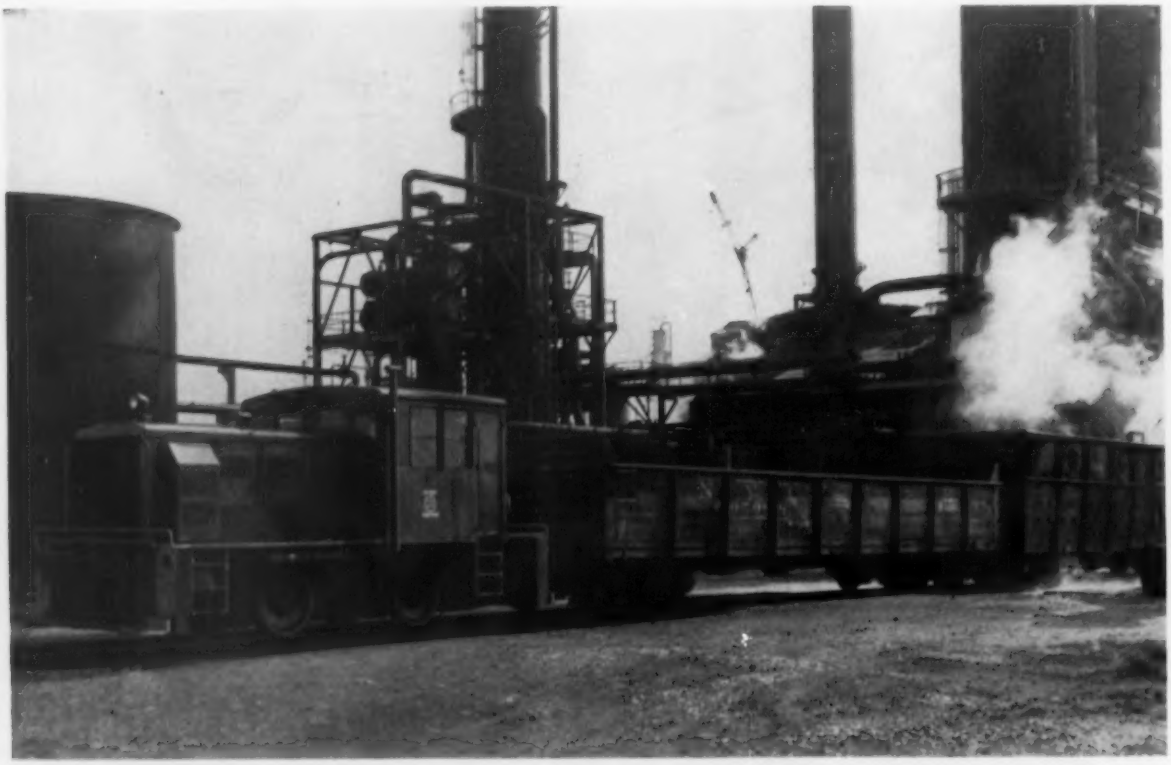
the LEES-BRADNER Company

CLEVELAND 11, OHIO, U.S.A.



MODEL 8 HOBBER · HY THREAD MILLER · 7-A ROTARY HOBBERS · CRI-DAN THREADING MACHINES · MODEL 40 THREAD MILLER · 8H SPLINE HOBBER · 12-S HOBBER

IF YOU THREAD OR HOB . . . GET A BETTER JOB WITH A LEES-BRADNER



Second Plymouth Gives Repeat Performance with

CONTINUOUS SERVICE for CITIES SERVICE

at East Chicago, Indiana, Delayed Coking Unit

Past performance of a 22 year old Plymouth 25-ton locomotive was the selling point when Cities Service purchased a Plymouth 35-ton Diesel Locomotive in 1952. Larger scale operations demanded a larger locomotive and continuous service was very important. Delays in coking had to be only those planned in the process . . . not the unexpected kind that stopped the process causing loss of production and needless expense.

That's where Plymouth pays off! After three years on the job 56 hours a week, Cities Service's Plymouth has proven its ability to give continuous service. Routine maintenance has been done while the locomotive is waiting to move cars. Plymouth's well known efficiency and economy help make the operation profitable as well as continuous.

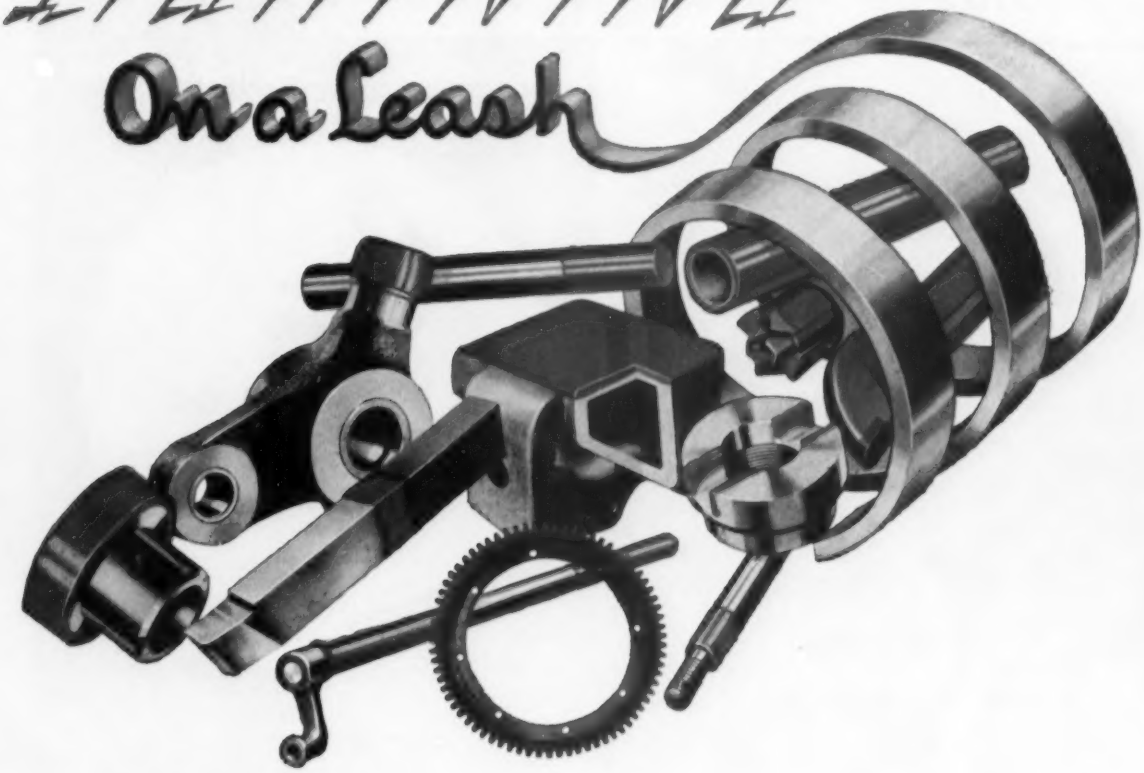
Steady service that is efficient and economical is available for your operation in Plymouth Locomotives from 3 to 70 tons. Gasoline or Diesel, mechanical or Torqomotive Drive.* Also Diesel-Electrics. Write for free catalog and specifications. PLYMOUTH LOCOMOTIVE WORKS, Division of THE FATE-ROOT-HEATH COMPANY, Dept. A-2, Plymouth, Ohio.

PLYMOUTH® TORQOMOTIVES

*TORQOMOTIVE DRIVE: Plymouth Transmission Coupled to a Hydraulic Torque-Converter

ALSO BUILDERS OF F-R-H CERAMIC MACHINERY

LIGHTNING On a Leash



TOCCO* Hi-Frequency Induction Heating Harnesses High Temperatures for Industry ...quick as a FLASH!

Whether your products involve heat treating, brazing, annealing or heating for forging of ferrous or non-ferrous metals TOCCO can do the job in seconds, with automatic accuracy—every part the same—ten or ten million.

Our application engineers, with 20 years of induction heating know-how, are glad to discuss how TOCCO can help you speed production, improve products and lower unit costs—at no obligation, of course.

Write for free 60 page booklet—"TOCCO Induction Heating"

THE OHIO CRANKSHAFT COMPANY

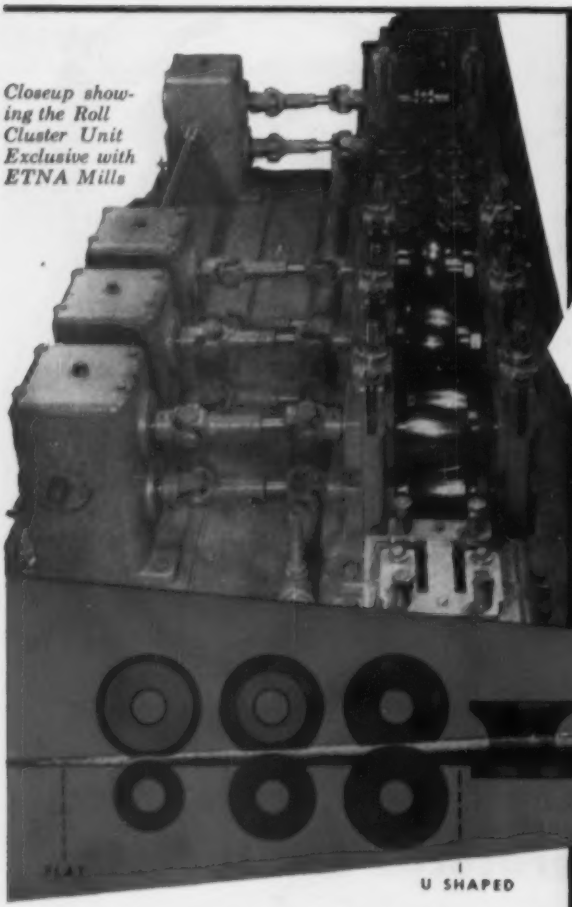
4628 East 71st Street • Cleveland 5, Ohio

World's Leading Manufacturer of Induction Heating Equipment

LEADING THE INDUSTRY IN DESIGN...

NO MARKING . . . NO SCRATCHING
NO UPSET EDGES . . .

THE Etna METHOD
FOR SMOOTH, WELL FORMED
STEEL TUBING



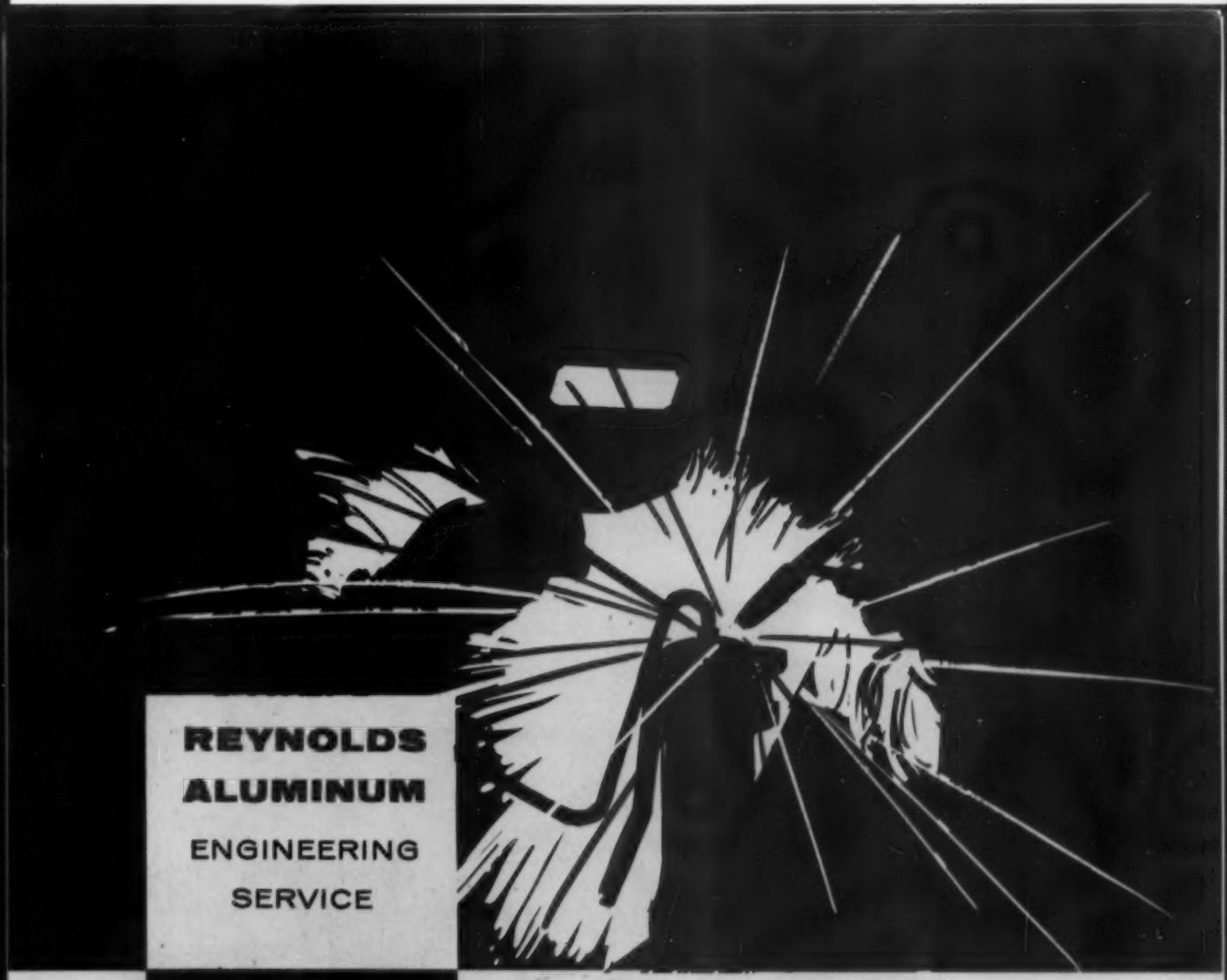
Closeup showing the Roll Cluster Unit Exclusive with ETNA Mills

Exclusive with Etna is the cluster unit. This unit progressively rolls the tube into shape without excessive stretching of the edges, thereby eliminating the "buckling" experienced with ordinary tube mills. Etna machines are not forming mills, they are designed for one purpose only . . . to make clear, well formed carbon and stainless steel tubing with no marking, no scratching, no upset edges. Write for complete details.

The ETNA 4KU Mill

Abbey ETNA Company

3420 MAPLEWOOD AVE., TOLEDO 10, OHIO



REYNOLDS ALUMINUM
ENGINEERING SERVICE

How Reynolds can help you work Aluminum better

To improve production with aluminum only small changes in fabrication methods and procedures are required. In making changes in welding, forming, casting, forging, machining, finishing, assembling with this light, strong, rustproof, versatile metal, call on Engineering Services.

The engineers and technicians in these Reynolds departments know aluminum. They know how standard machinery and equipment can be simply adjusted to aluminum's requirements. Their expert knowledge of aluminum will help you work aluminum most efficiently...make your products better and more profitable.

You can have the aluminum know-how of Reynolds engineers and technicians in book form, too. On the opposite side of this page is a complete listing of Reynolds Handbooks, invaluable aids in getting more from aluminum.

Reynolds Engineering Services are available through the Reynolds Metals office near you listed under "Aluminum" in your classified telephone directory, or write direct to Reynolds Metals Company, P. O. Box 1800-JU, Louisville 1, Kentucky.

REYNOLDS ALUMINUM
LET THIS SEAL HELP YOU INCREASE SALES. WRITE FOR DETAILS.

Which of these will help you most?

A LIBRARY OF HANDBOOKS filled with important and useful information on aluminum design and fabrication. If your job is management, design or production, these books can be vital to you. Single copies of any or all of these are yours without cost when requested on your business letterhead.

ALUMINUM DATA BOOK—160 tables give complete physical, chemical and mechanical properties; availability data, tolerances, definitions, fabrication information . . . 220 pages.

DESIGNING WITH ALUMINUM EXTRUSIONS—Explains the basic principles for using extruded aluminum shapes most effectively . . . 138 pages.

ALUMINUM STRUCTURAL DESIGN—Shows how to design original structures with aluminum or convert present designs to aluminum . . . 130 pages.

FASTENING METHODS FOR ALUMINUM—Offers information on mechanical joining and fastening methods, and the advantages of each . . . 124 pages.

FINISHES FOR ALUMINUM—Gives basic data on application and uses for electroplated, mechanical, chemical and organic finishes . . . 124 pages.

ALUMINUM FORMING—Presents accepted practices for bending, forming and drawing aluminum . . . 152 pages.

MACHINING ALUMINUM ALLOYS—Covers aluminum machining including automatic screw machining . . . 124 pages.

HEAT TREATING ALUMINUM ALLOYS—Explains the theory and procedures for heat treating aluminum alloys... 119 pages.

WELDING ALUMINUM—Gives complete data on the welding, brazing and soldering of aluminum . . . 186 pages.

ALUMINUM POWDERS AND PASTES—Describes types of powders and their uses in paints and coatings, pyrotechnics, processing, metallurgy and other applications . . . 84 pages.

16mm Sound-Color Films Available, too

1. **SHAPE OF THINGS TO COME** (extrusion design and application)
2. **TALE OF THE POWDERED PIG** (powders and pastes and their uses)
3. **PIGS AND PROGRESS** (aluminum from mine to finished products)

A COMPLETE INDEX

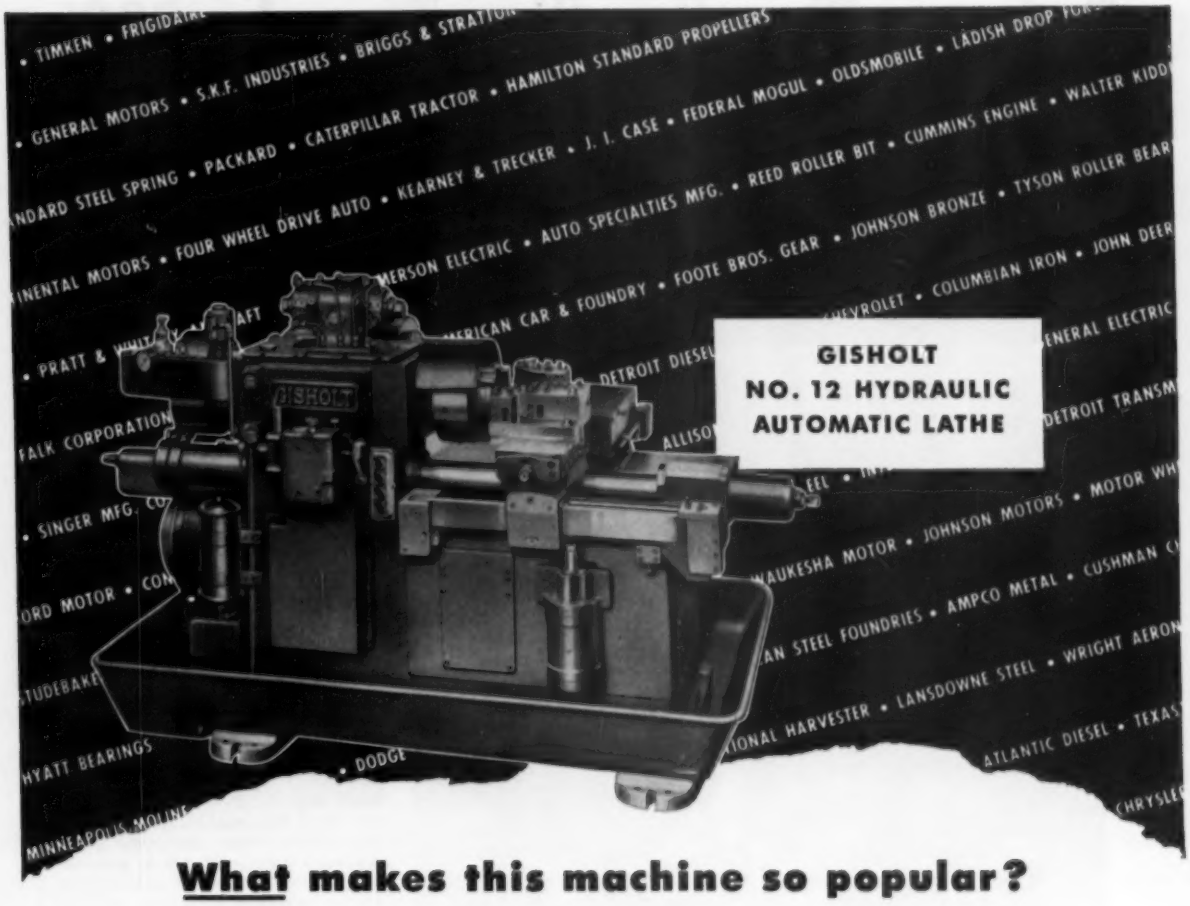
of all Reynolds Technical Literature and Films on aluminum design and fabrication is also available. Write to Reynolds Metals Company, P. O. Box 1800-JU, Louisville 1, Kentucky.

Instructors in technical schools are also invited to take advantage of these educational aids. Write for details.

REYNOLDS

ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND



What makes this machine so popular?

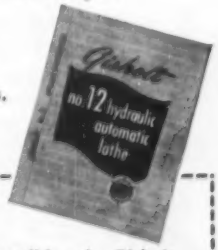
It's the simple basic application of hydraulic principles—perfected through the years. It's a single spindle machine that handles all classes of work—holding with a chuck or an arbor, with fixtures, or with a work driver for between centers. Front carriage alone will perform 14 different cycles. Independent rear slide can be positioned at any angle to the work. Feeds are infinitely adjustable...not limited by cams. Here's the versatility, the speed, the automatic cycle, and the easy change-over that mean big savings for scores of users. Why not for you?

If you have parts up to 12″ to produce at lower cost, look at the Gisholt No. 12 Hydraulic Automatic Lathe. Call your Gisholt representative. Or write us.

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

This new catalog will show you why.

All operating features are clearly described, fully illustrated. Here, too, are 28 different jobs to show many classes of work and tooling possibilities. Write for your copy.



Gisholt Machine Company
Madison 10, Wisconsin

Please send my copy of the catalog describing the Gisholt No. 12 Hydraulic Automatic Lathe.

Name.....*Title*.....

Company.....

Address.....

City.....*State*.....

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES
SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

Reduces Pipe Handling Time by 83%

Savings Pay for Tramrail System in One Year

The Tramrail transfer crane travels in the middle bay and connects as desired with the spur tracks over the side bays, thus enables the hoist carrier reaching every part of the room. Incoming pipe is lifted from railroad cars with a Cleveland Tramrail hoist carrier operating on a track serving the floor above and lowered through the hatchway at one end of this warehouse.

Outgoing pipe is brought directly from storage to trucks. The hoist and entire system is rated at one ton.

SEVERAL hundred tons of ⅛ to 16 inch diameter pipe are received at the Pipe Warehouse of Palmer Supply Co., Seattle, Washington, per month. To handle this by hand was such a loathsome chore that it was difficult to keep men at this work, and the labor turnover was large.

The installation of a Cleveland Tramrail track and transfer crane system took over the fatiguing job of lifting, as well as hauling, of the pipe into and out of the warehouse. It made possible the handling of large, heavy bundles per trip in less time than required for one or a very few pipes by manual handling. It thereby reduced the man-hours required for pipe handling to approximately one-sixth. Resulting dollar savings paid for the system in one year.

Cleveland Tramrail equipment offers you so much and pays off in so many ways for such a long time that we urge you to study its possibilities in your plant.

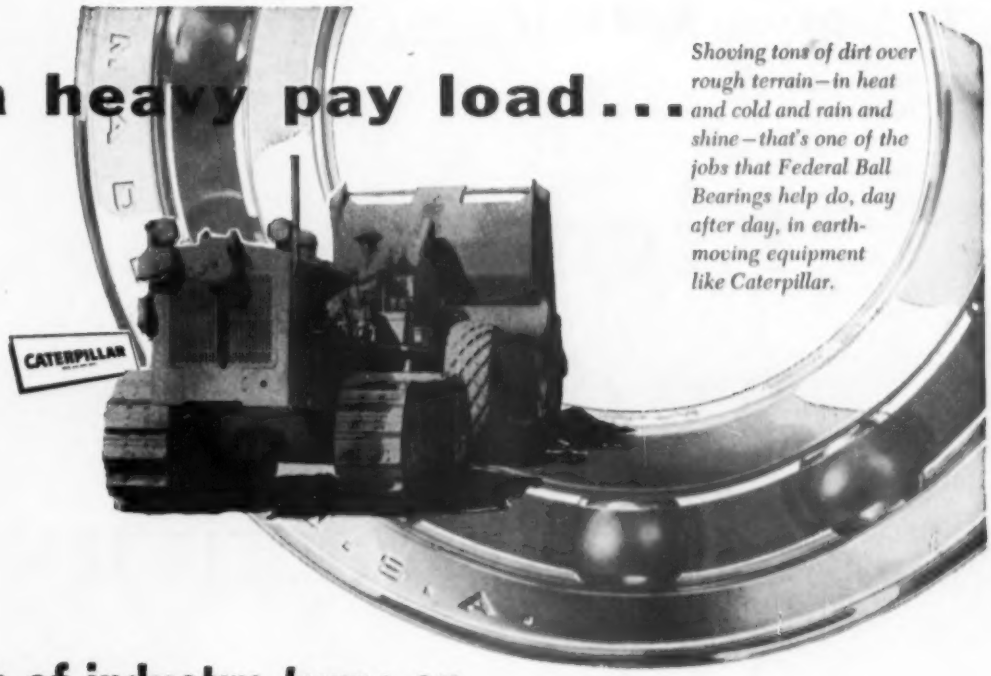
GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
4807 EAST 290th STREET, WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

for a heavy pay load...



Shoving tons of dirt over rough terrain—in heat and cold and rain and shine—that's one of the jobs that Federal Ball Bearings help do, day after day, in earth-moving equipment like Caterpillar.

so much of industry *turns* on FEDERAL ball bearings

Out in the open—or in on a desk—out on the road or up in a plane—the chances are you'd find Federal Ball Bearings quietly and efficiently at work—in some of the hundreds of types and 12,000 sizes this 50-year-old company is currently producing. When Federal Ball Bearings are a part of so many things you *use*, why shouldn't they be a part of the things you *make*?

THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, N. Y.

or a heavy pay roll...

Business counts on business machines to keep working smoothly with little or no attention—one reason why so many business machine makers like IBM count on Federal Ball Bearings.

Have a look at the 175 pages of ball bearing information in Federal's catalog. Just drop us a line and we'll send you your copy.

Federal

BALL BEARINGS

One of America's Largest Ball Bearing Manufacturers

To help you find that just-right plant site...

Every day we chart the business activity of 2319 communities

in Michigan, Indiana, Ohio, Kentucky, West Virginia, Virginia, Tennessee

THE RESULT . . . a perpetual inventory of plant-site information about a 45,000-square-mile territory abounding in low-cost fuel and power for all types of metal-working industries. This data is unequalled in up-to-the-minute accuracy and completeness.

For nearly fifty years, the American Gas and Electric System has served practically every home and business in this growing seven-great-state area that now includes 2319 towns.

Our men are in these communities every day, every week of the year—a network of on-the-job personnel carefully reporting changes of economic and social import.

Whether your need is dispersion, decentralization or expansion, the American Gas and Electric Company can help simplify your plant-site selection problem. As it has for hundreds of other manufacturers, both large and small, it can bring pertinent information right to your desk ready for measurement by your own yardstick.

* * *

You will find that this service will save many hours of valuable executive time in investigation and analysis. There is no charge. All we have to sell is power from capacity sufficient to meet the needs of any industry.

AMERICAN GAS AND ELECTRIC COMPANY
30 CHURCH ST., NEW YORK 8, N. Y.

OPERATING AFFILIATES:

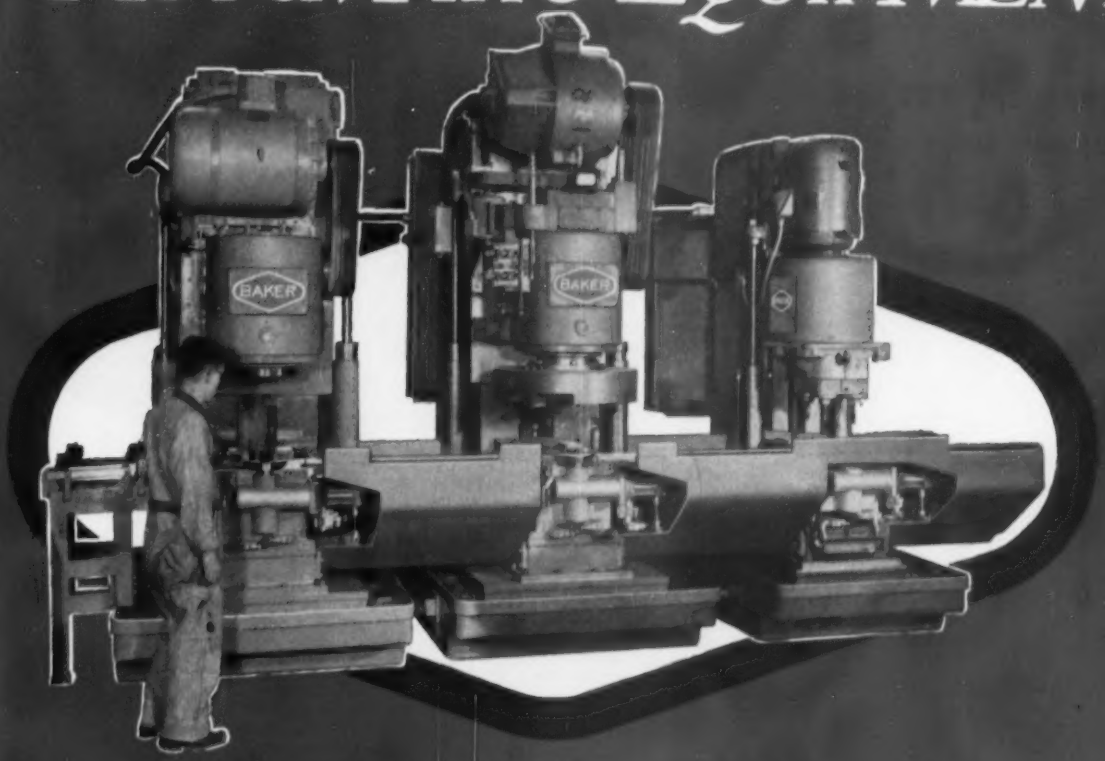
APPALACHIAN ELECTRIC POWER COMPANY
INDIANA & MICHIGAN ELECTRIC COMPANY
KENTUCKY POWER COMPANY
KINGSPORT UTILITIES, INC.
OHIO POWER COMPANY
WHEELING ELECTRIC COMPANY

To get a more detailed description of the many industry advantages in the American Gas and Electric service area, write for the brochure "A 7-State-Plant-Site Trip—in 5 minutes."

You'll learn about water, transportation, labor, taxes, raw materials, education, community character and atmosphere and many other data necessary for pleasant, profitable plant operation. Address your inquiry in confidence to Mr. Lee Davis, Manager Area Development, 30 Church St., New York 8, New York.

The Average Shop Needs and Now Can Afford

AUTOMATIC EQUIPMENT



The new three standard unit Baker Machine introduced at the show, is combined to operate as a transfer machine, set up with a low cost, simplified fixture, proving the possibility of providing automatic machines through use of STANDARD MACHINES . . . And thereby achieving automation without tremendous expenditure. Operations on the new Baker Transfer are Combination Bore & Counterbore . . . Face (cross feed) . . . and Multiple Drill . . . All Automatically. Write regarding your specific job problems.

BAKER

Standard and Special
Drilling . . . Boring . . . Tapping
Keyseating and Contour Grinding Machines

BAKER BROTHERS, INC.

TOLEDO 10, OHIO

NO SINGLE WELDER WILL DO IT ALL!

THERE'S EXACTLY
THE RIGHT **miller** WELDER
TO MEET EVERY WELDING REQUIREMENT

MILLER SR RECTIFIER TYPE DC ARC WELDERS

Available in 200, 300, 400 and 600 amperes, it is a superior direct current welder using Miller Unitran transformer control and selenium rectifiers for conversion from 3 phase AC line current. Miller SR Welders feature widest possible current range, extreme arc flexibility, maximum electrode deposition rate and highest electrical efficiency.

THE *New* MILLER SRH RECTIFIER TYPE DC ARC WELDER

A new concept in welder design for all DC metalic arc welding. Available in 200, 300 and 400 amperes. It is ruggedly constructed, compact, and is designed to lend itself to stacking for parallel operation or to conserve floor space. It has single range control and is weatherproof.

MILLER ARC WELDERS FOR TUNGSTEN ARC WELDING PROCESS

These Miller Welders feature the patented Miller UNITRAN control circuit which combines the transformer with its own integral flux diverter. This, in conjunction with adequate open circuit voltage, high frequency, balancing resistor and optional controls insures superior uniformity and flexibility throughout the entire welding range. Available in nine models.

THE *New* MILLER MULTI-ARC COMBINATION AC-DC WELDER

Available in 14 models, this new Miller Welder provides both AC and DC welding power for applications where both are required. It operates from a single phase power line and is available with high frequency and controls designed especially for inert gas arc and spot welding.

MILLER 100 SERIES HEAVY DUTY INDUSTRIAL TYPE AC WELDERS

Designed for heavy production welding and automatic welding applications. Available in eight models. The 100 Series Welders permit faster welding—as much as 35% faster. Movable coil design and 80 volts O.C.V. produces uniform and better welding characteristics throughout the entire range of the welder.

Write today for complete information on these Miller Welders.

ARC • SPOT miller GENERATORS WELDERS

miller

ELECTRIC MANUFACTURING CO., INC.
P.O. Box 798 Appleton, Wisconsin

"... if it's MILLER you know it's the finest..."

NEW... *more than a catalog—*

—it's practically a "treatise" on gears

Never before, to the best of our knowledge, has so much helpful information been assembled between the covers of a *gear catalog . . . 72* pages of illustrations, diagrams, definitions, tables, charts, and explanations regarding all types of gears. If you design, use or buy gears, you can't afford to be without a copy of this Book—so fill in coupon below for your copy of this valuable text.

PHILADELPHIA GEAR WORKS INCORPORATED

ERIE AVE. AND G ST., PHILADELPHIA 34, PA.

NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.
BALTIMORE • CLEVELAND

Virginia Gear & Machine Corp., Lynchburg, Va.

Industrial Gears & Speed Reducers • LimiTorque Valve Controls

Established 1892

PHILADELPHIA GEAR WORKS, INC.
Erie Ave. & G St., Phila. 34, Pa. IA

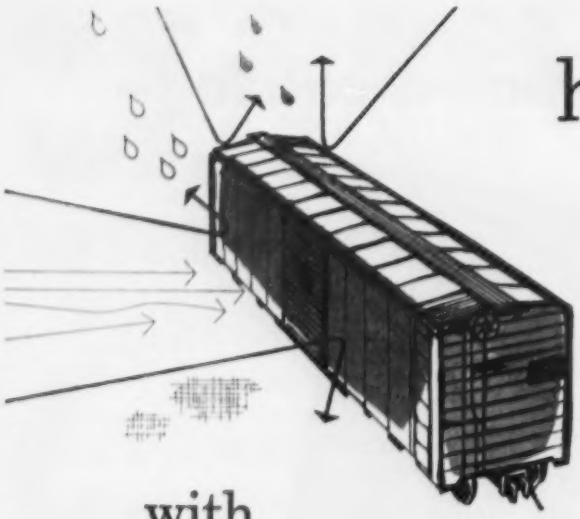
Please send me a copy of your NEW 76 page GEAR BOOK.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



how to rust-proof a freight-car with FERRO-PAK®

by Cromwell

A leading wire manufacturer discovered this economical, easy way to use Cromwell Ferro-Pak VCI Paper to insure rust-free shipping of bright finished wire. Wire coils are shrouded with sheets of Ferro-Pak and the paper is used to line the sides of the car as well. Chemical vapors travel outward from both sides of the paper, forming an invisible protective film around the wire that doesn't give rust a chance to get a foothold. Non-toxic Ferro-Pak vapors are effective almost indefinitely under most conditions.

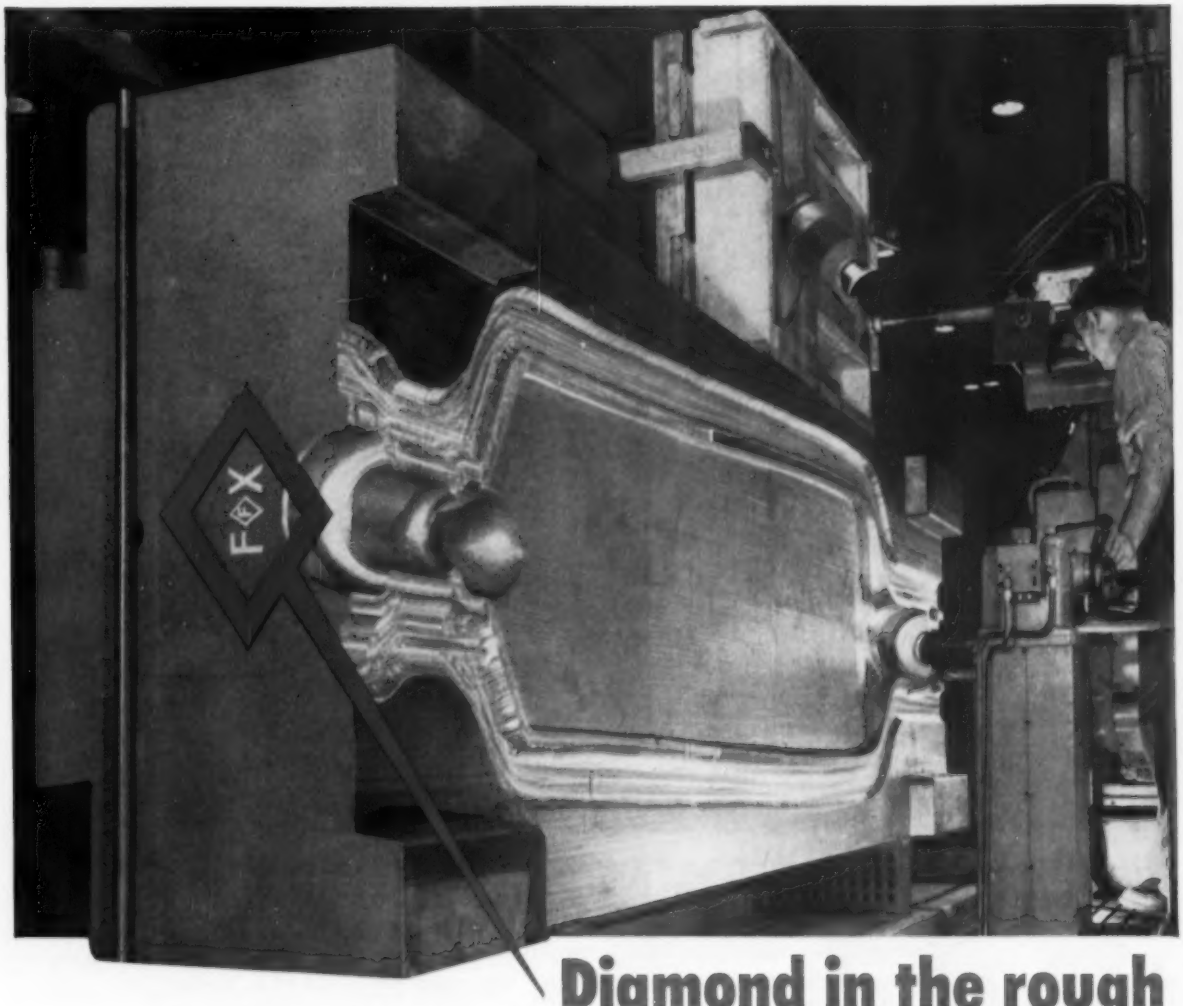
Think how this clean, fast, easy rust preventive method can save you money! No more dipping, slushing, scraping, wiping. No more costly extra packaging. To protect any ferrous metal product, you simply wrap it and it's rust-proofed—unwrap it and it's ready to use. Ferro-Pak comes in rolls, sheets, bags, envelopes, liners and covers. And we combine it with many other materials for a wide range of special uses.

For an interesting brochure on how you can cut costs with Ferro-Pak in packaging, shipping, storage and maintenance, write on your letterhead today.

Cromwell PAPER COMPANY • 4803 South Whipple Street • Chicago 32, Illinois •

MANUFACTURERS OF: Papers (Impregnated • Coated • Laminated • Reinforced • Flexible) Bags • Sacks • Liners • Covers • (Single and multiwall construction, using all types of material to carry, cover or protect all types of products.)

Shrouding with Ferro-Pak VCI Paper quickly transforms an ordinary freight-car into a huge rust-proof package.



Diamond in the rough

This 42,000 pound Finkl FX die nearing completion at the Ladish Co., Cudahy, Wisconsin, will be utilized by that firm in drop forging 1681 pound close tolerance aircraft propeller blades. FX is but one of many Finkl steels available for forging operations, all of which are quality controlled with "built-in" characteristics required for precision production. For the proper die steels to fit your needs, ask your local Finkl representative or write for the Finkl catalog.

When you next consider hot work tooling, die blocks, or forgings, call on Finkl for "impressions that last."

DIE BLOCKS
•
HOT WORK STEEL
•
FORGINGS
•
ELECTRIC FURNACE STEELS

Offices in: DETROIT • CLEVELAND • PITTSBURGH • INDIANAPOLIS
HOUSTON • ALLENTOWN • ST. PAUL • COLORADO SPRINGS
SAN FRANCISCO • SEATTLE • BIRMINGHAM • KANSAS CITY
Warehouses in: CHICAGO • EAST CAMBRIDGE • LOS ANGELES

A. Finkl & Sons Co.
2011 SOUTHPORT AVENUE • CHICAGO 14

HYATTS HELPED THIS MILL ROLL UP A WORLD'S RECORD

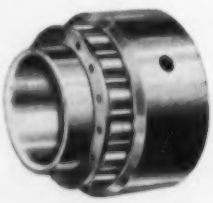
522 ingots in one 8-hour turn at J & L's Aliquippa Works!

The main table, approach table, runout table and lineshafting on this record-breaking 46″ Blooming Mill are equipped with HYATT Roller Bearings. Why? Because Jones & Laughlin, like so many leading steel producers, has found that the name HYATT is the hallmark of highest quality in roller bearings. It means expert engineering, fine fabrication and above all, *outstanding performance*—the ability to keep on absorbing punishment long after ordinary bearings have hit the scrap-heap!

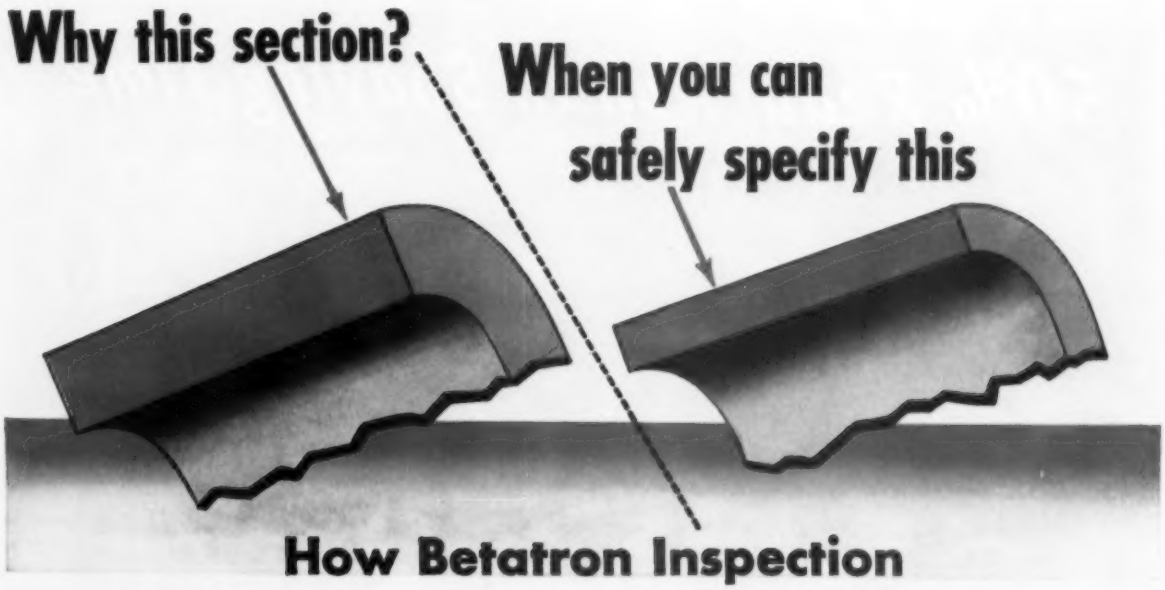
No wonder HYATTS rate so well with J&L! If *you* want the same kind of record-breaking service from roller bearings, the man to see is as near as your telephone—your HYATT Sales Engineer. Give him a ring right now and let him give your production a lift! Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT

STRAIGHT ◯ BARREL ◯ TAPER ◯



ROLLER BEARINGS



How Betatron Inspection

Cuts Production Costs

New Opportunities for design economies are being opened for many manufacturers by Allis-Chalmers 22-million-volt betatron. For example, it is possible to eliminate overdesign because betatrons permit thorough inspection of forgings and castings. The result is a product far easier to manufacture, with sizable reductions in raw material requirements.

In addition, there is a marked competitive advantage when betatron inspection provides extra assurance of quality control.

Betatrons are being used to inspect parts or whole machines. In some cases, they inspect alignment of parts deep in an 8-in. steel section. Cracks only .002 in. wide are readily detectable.

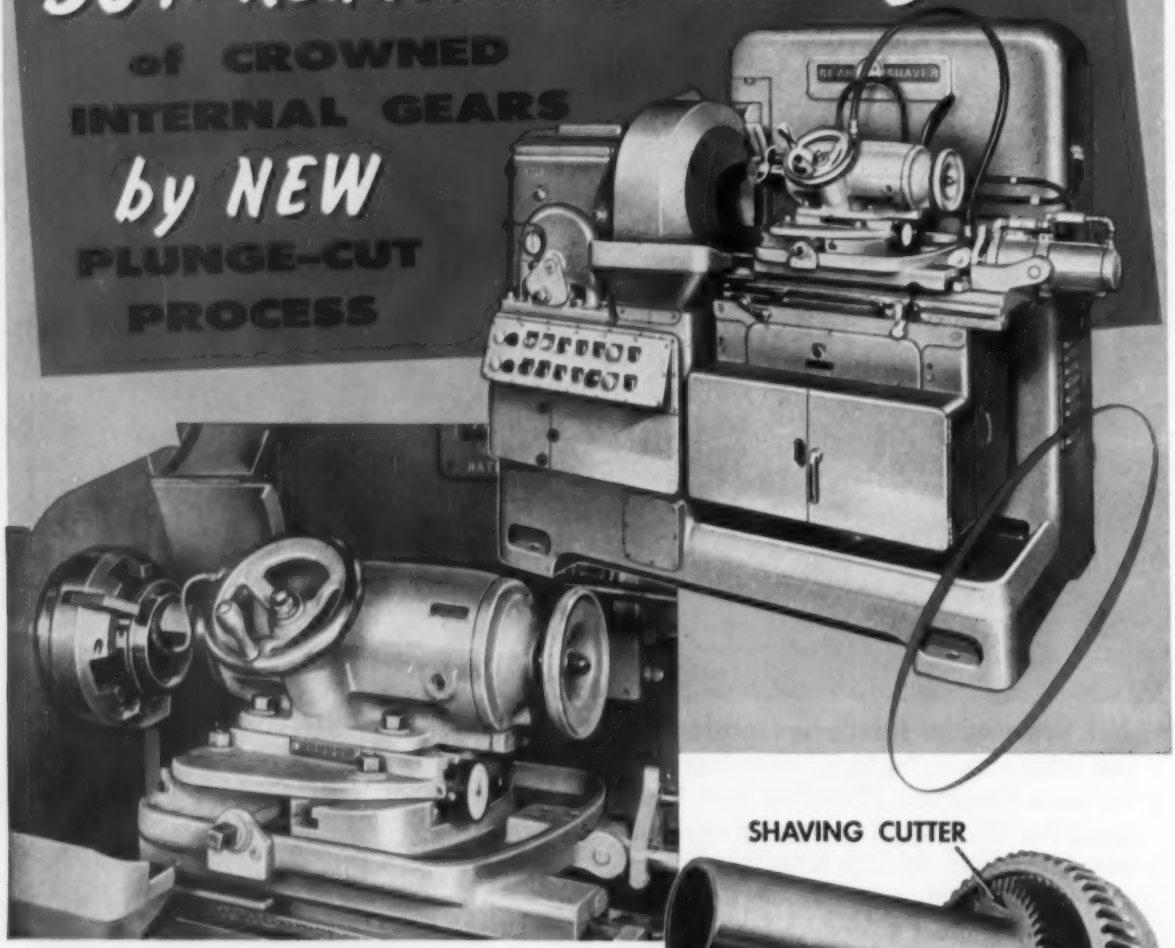
Betatrons are fast. They radiograph equipment on an assembly-line basis if desired. In most cases, present personnel can operate them.

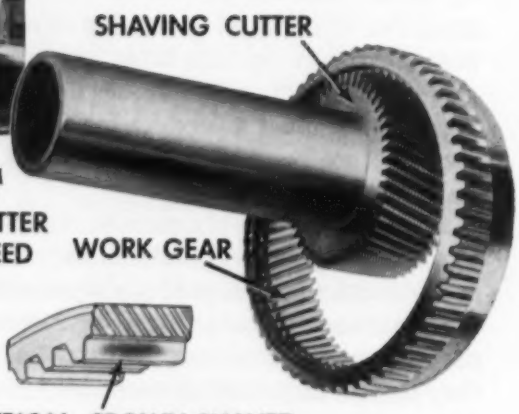
Get complete information from your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin. A-4835

ALLIS-CHALMERS

50% Reduction in Shaving Time

of CROWNED INTERNAL GEARS by NEW PLUNGE-CUT PROCESS





This typical internal automatic transmission gear is crown-shaved in 24 seconds machine time with the tooling shown.

Amount and position of crown for any specific work unit is optional.

The Plunge-Cut Process is equally applicable to straight-tooth gears and with the same economy in shaving time.

If you are mass-producing internal gears, write for Bulletin S55-6 on Internal Gear Shaving Machine, Model GCR

NATIONAL BROACH AND MACHINE CO.

5600 ST. JEAN . . . . . DETROIT 13, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

Now—here's
real fire prevention
for your plant . . .

New Fire-Resistant

Gargoyle NYVAC Hydraulic Fluids

Do you use hydraulic machines near furnaces, molten metal pots, red-hot steel slabs or other sources of ignition? If so, with oil in service, you have the possibility of a fire that could badly cripple your production.

New fire-resistant Gargoyle Nyvac hydraulic fluids will help prevent such fires.

There are two types of these fluids—a straight synthetic fluid and a synthetic water base fluid. Both have been thoroughly proved in the field. Your particular machines and operations will dictate which product is best for your plant.

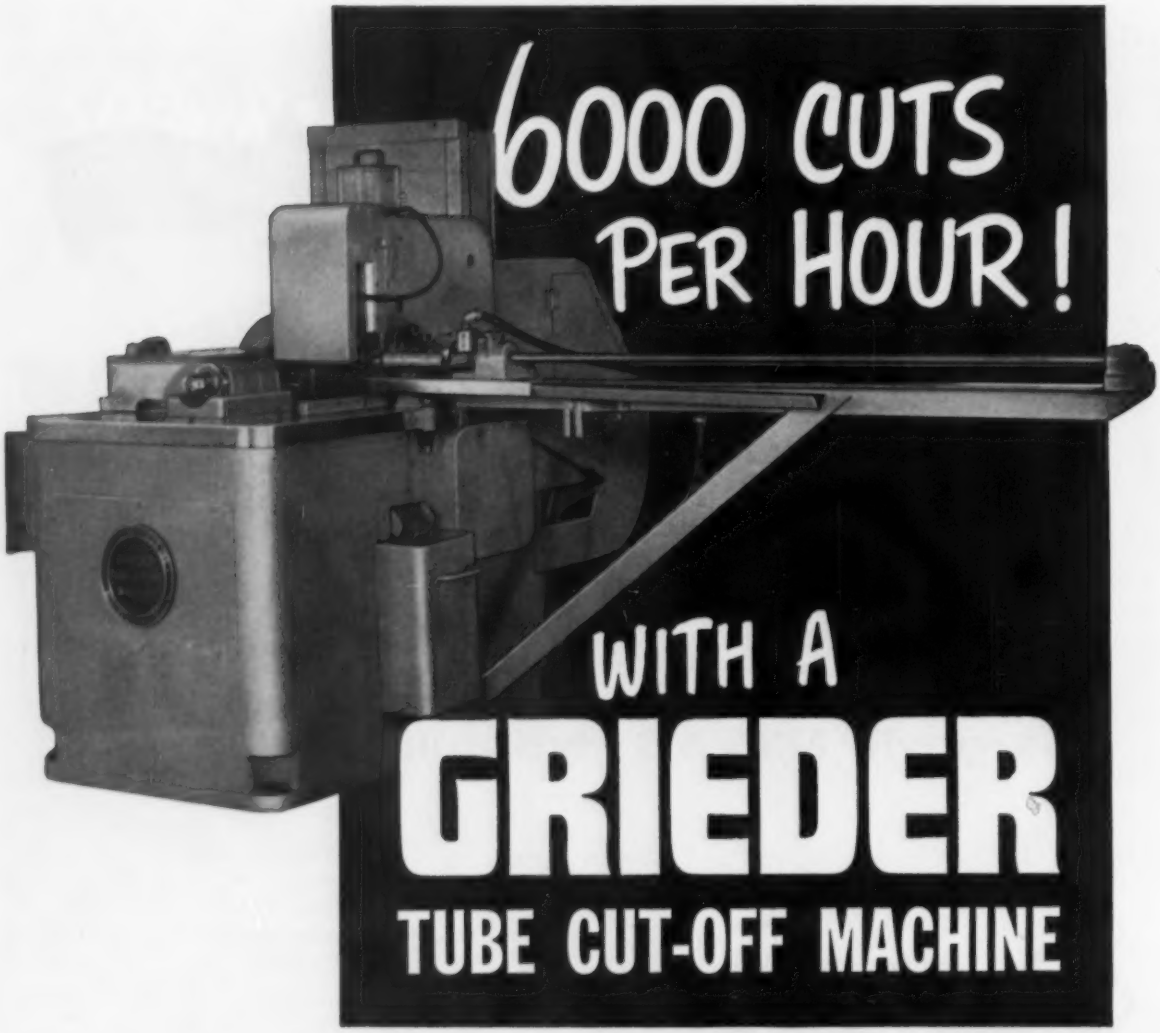
Although synthetic in composition, these new products are still designed to keep your machines running on full production schedules with low maintenance costs. They are backed by Socony Mobil's complete engineering service.

The new Nyvac fluids round out Socony Mobil's complete line of top-quality hydraulic fluids—all available from a single source of supply. Call your Socony Mobil man for complete details.

Socony Mobil *Correct Lubrication*

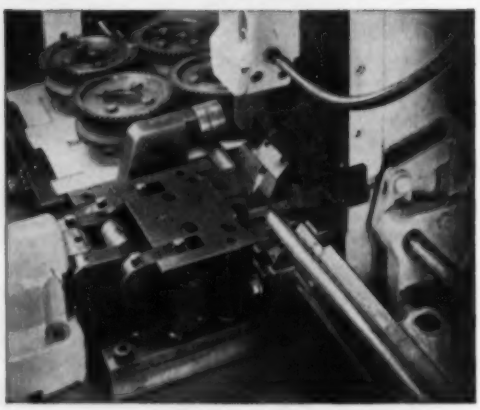
FIRST STEP IN CUTTING COSTS

SOCONY MOBIL OIL CO., INC., and Affiliates: MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.



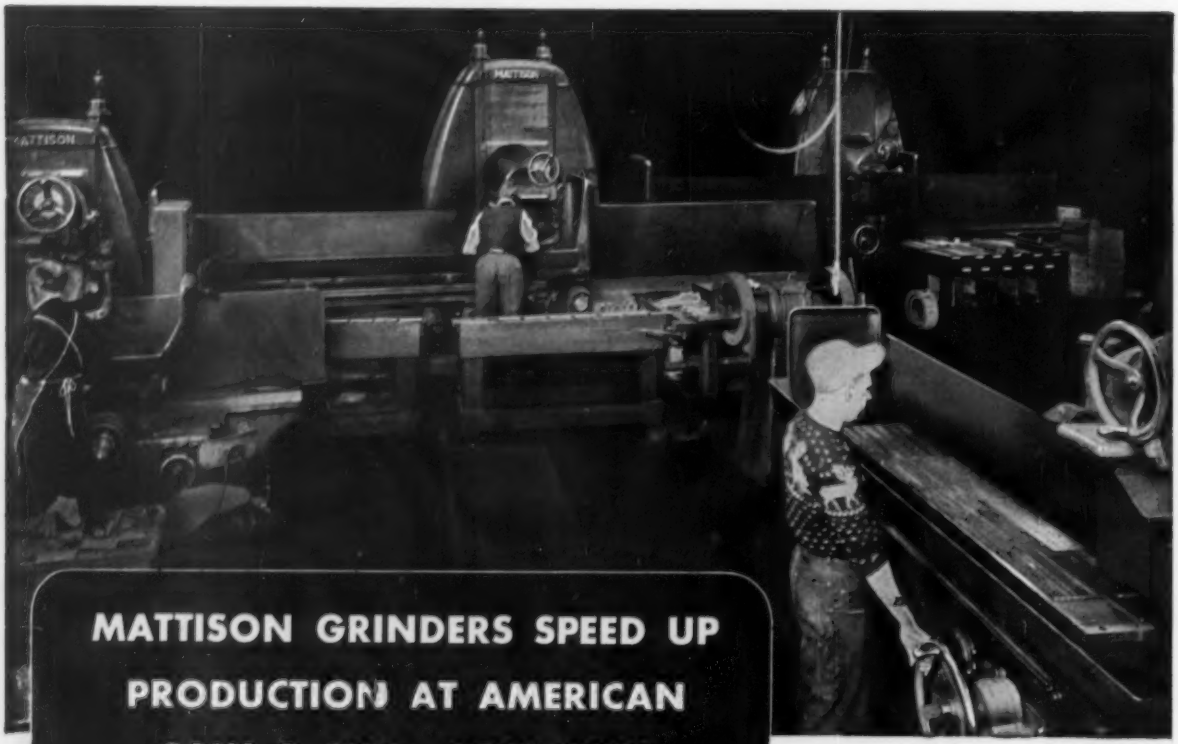
NO DISTORTION... MINIMUM BURR...
ACCURACY WITHIN .002"...
CUTS ANY SHAPE...

Cut steel tubing at the amazing speed of 6000 cuts per hour. The Grieder Tube Cut-Off Machine features a heavy duty air operated combination clutch and brake unit that allows continuous operation at this terrific rate of production. Fully automatic . . . Rate of feed: 600 feet per minute . . . True cutting. Get full information, multiply your tubing production, reduce costs, write *today*.



GRIEDER INDUSTRIES, INC.
BOWLING GREEN, OHIO

WE'D ENJOY
Serving You
TOO!
WALLACE BARNES COMPANY
BRISTOL, CONNECTICUT
THE WILLIAM D. GIBSON COMPANY
1800 CLYBOURN AVE. CHICAGO 14, ILL.
RAYMOND Manufacturing COMPANY
CORRY, PENNSYLVANIA
BARNES-GIBSON-RAYMOND
40300 PLYMOUTH RD. PLYMOUTH, MICH.
B-G-R COOK PLANT
ANN ARBOR MICHIGAN
DIVISIONS OF ASSOCIATED SPRING CORPORATION
COAST TO COAST
SEABOARD Coil Spring Div.
15001 S. BROADWAY GARDENA, CALIF.
OHIO DIVISION
1825 EAST FIRST ST. DAYTON, OHIO
WALLACE BARNES CO.
STATE FAIR BLVD. SYRACUSE 9 (Salina), N.Y.
MILWAUKEE DIVISION
341 E. ERIE ST. MILWAUKEE, WIS.
DUNBAR BROTHERS COMPANY
BRISTOL, CONN.
F. H. MANROSS AND SONS CO.
BRISTOL CONNECTICUT
THE WALLACE BARNES CO., LTD.
HAMILTON CANADA



MATTISON GRINDERS SPEED UP PRODUCTION AT AMERICAN SAW & MFG. COMPANY

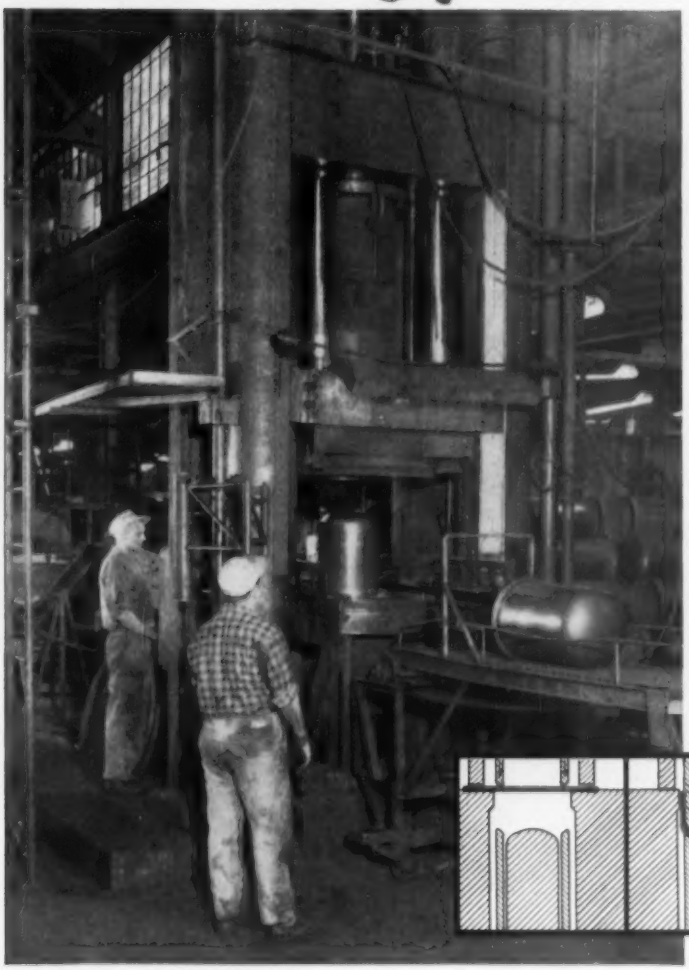
● The four Mattison High Powered Precision Surface Grinders shown above are used by American Saw & Mfg. Company for the grinding of annealed tool steel strips and bars on a real production basis in the manufacture of Lenox Precision-Master Ground Flat Stock. Exacting manufacturing specifications demand excellent finishes within close limits of accuracy.

The massive double column support, high power and rigidity of construction of the Mattison Grinder combine with accuracy and speed of operation to insure consistent precision results on a high production basis for American Saw & Mfg. Company. For complete information regarding the capabilities of the Mattison High Powered Precision Surface Grinder send for free circular.

MATTISON MACHINE WORKS

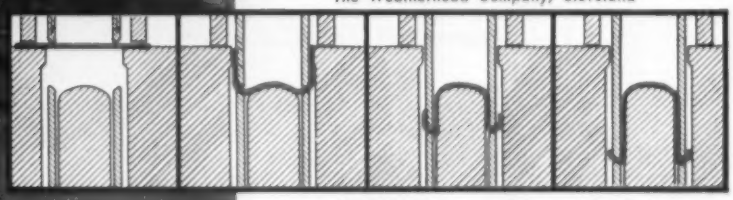
ROCKFORD · ILLINOIS

Half-a-Cylinder IN ONE PRESS STROKE!



K. M. Wilmore, Plant Manager, The Weatherhead Co., reports on their success with an H-P-M press using the reverse draw method. *"Our 500-ton H-P-M has operated 'round the clock for months at a time during the past five years. We are very pleased with its performance in the manufacture of 100-pound capacity L-P Gas cylinders."*

K. M. Wilmore, Plant Manager
The Weatherhead Company, Cleveland



H-P-M 500-ton press drawing L-P Gas cylinders at Weatherhead.

In the reverse drawing method, this H-P-M press transforms a blank into a shallow cup. Then it literally turns the cup inside out as it continues the draw — all in one continuous stroke. It does the work of several presses; handling and heat-treating between draws are eliminated. Parts are uniform in thickness and quality . . . rejects are reduced to a minimum.

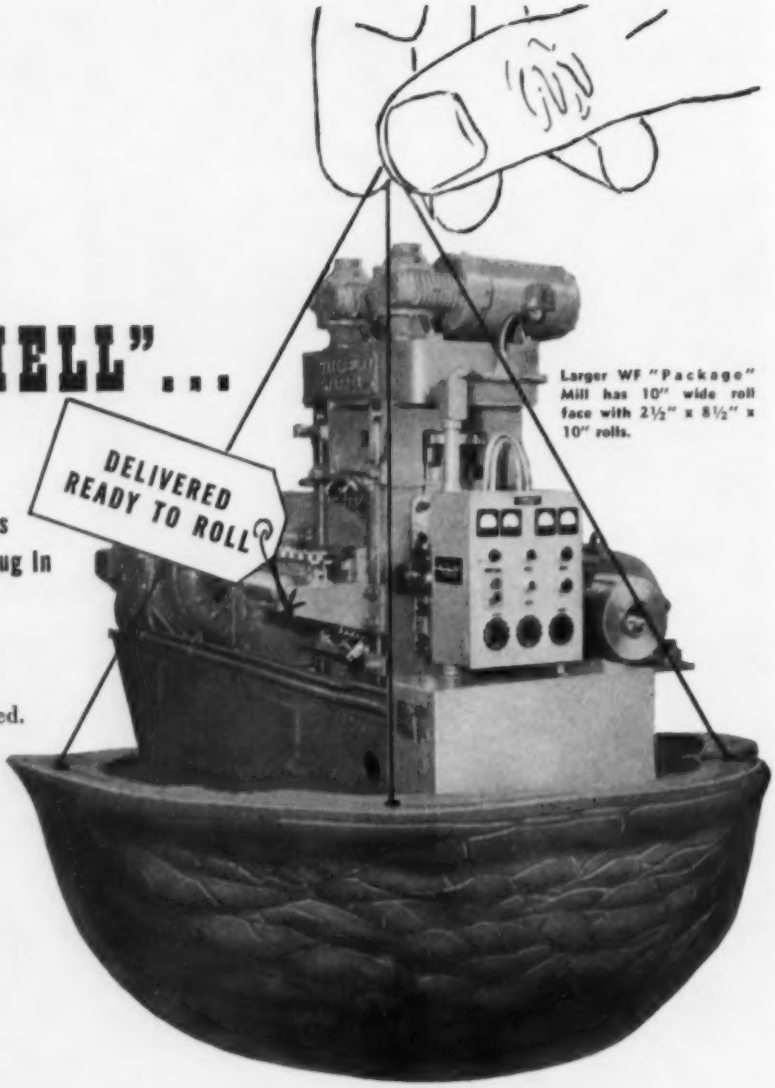
The H-P-M FASTRAVERSE press is infinitely adjustable, permitting the press to be easily and quickly regulated for each specific draw job. Accurate control of drawing speed, plus total elimination of high impact stresses, guarantees proper metal flow. Independent control of each hydraulic action provides just the right tonnage for each job. Investigate these versatile "all-hydraulic" production units. Draw your sheet metal hydraulically.

THE HYDRAULIC PRESS MFG. COMPANY
1006 MARION ROAD
MOUNT GILEAD, OHIO, U. S. A.

HPM

Waterbury Farrel's
New, ONE-PIECE

STRIP MILL "IN-A-NUTSHELL"...

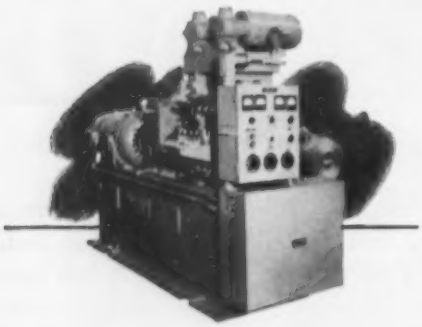


Larger WF "Package" Mill has 10" wide roll face with 2½" x 8½" x 10" rolls.

WF's 4-High "Package" Rolling Mills Are Compact, Low Cost, Ready To Plug In

You can start precision-rolling ferrous or non-ferrous strip as soon as you plug in the electrical connection.

This mill is completely self-contained. Drive, gear case, controls, lubrication system, winder and winder drive are assembled with the mill, itself, into a single, compact unit. When necessary, it can easily be moved in one piece to a new location.



Some Construction Features: Mill frame of unit welded plate steel gives maximum strength and rigidity . . . assures greater accuracy and lasting alignment . . . alloy steel work rolls mounted in needle bearings . . . alloy steel back-up rolls drilled for water cooling, mounted in double row Timken bearings with tapered sleeve . . . independent power screwdowns . . . long and short roll necks and staggered couplings permit heavier construction for maximum torque capacities . . . lucite cover on welded steel gear case facilitates inspection . . . variable speed tension control drive, using AC power, cuts control cost and permits compact panel.

Contact Waterbury Farrel for complete details. No obligation.

WATERBURY FARREL FOUNDRY & MACHINE CO. • WATERBURY, CONN.

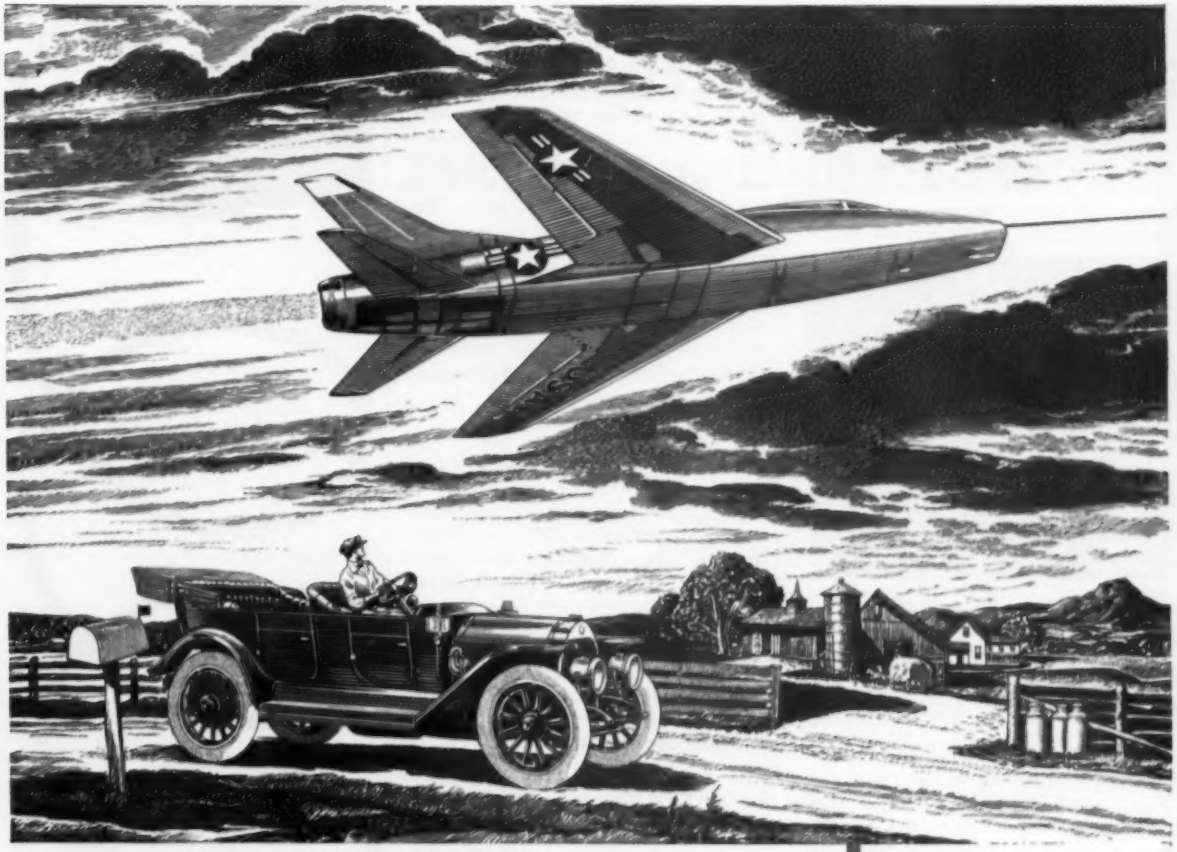
A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY FARREL

MILL MACHINERY—Rolling Mills: Strip, Rod, Wire Flattening, (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc. *WIRE MILL EQUIPMENT*—Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers Swagers • Bull Blocks • String-up Machines • Spoolers, etc. *COLD PROCESS BOLT & NUT MACHINERY*—Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Toppers, etc. *POWER PRESSES*—Crank, Cam and Toggle; also Rack and Pinion Presses • Eyelet Machines Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc.

WATERBURY FARREL FOUNDED 1851

WF-17 A

From the Stoddard-Dayton to the Super Sabre



Speco's creative engineers have opened new horizons in precision!

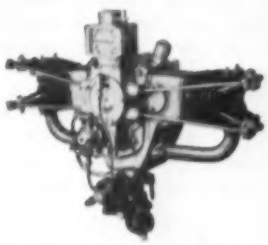
If you recall the Stoddard-Dayton, then surely you remember the Jenny – the sweetheart of World War I. They were a couple of kids who "grew up together" . . . the car and the airplane. And today their grandchildren are the mainstays of our national economy.

We like to feel that our leadership in precision on a mass production basis has played a big role in this growth. Our work in all industries–automotive, aviation, industrial . . . in fact, in all fields of mechanics and hydraulics – has made great contributions. Our team of precision engineers, toolmakers and machinists makes certain that *If We Ship It . . . It's Right!* If you have a job with which you feel we might help, a short letter or a telephone call will bring prompt, sound guidance. Or if you'd like the whole SPECO story–from plant to people to products, send for our new Plant Brochure. The Steel Products Engineering Company, Springfield, Ohio.

THE STEEL PRODUCTS ENGINEERING COMPANY

SPECO

BEAUTIFUL 11" X 14" REPRODUCTIONS OF THIS PICTURE SUITABLE FOR FRAMING WILL BE SENT ON REQUEST—FREE.



One of our early contributions to aviation–this two cylinder, Opposed Piston Blower Engine produced by Speco in 1924.

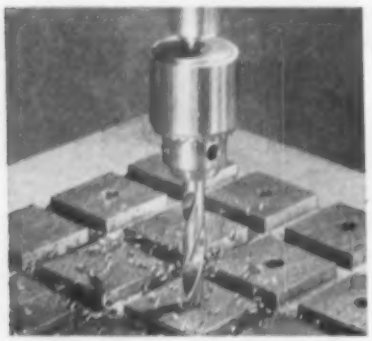
Today we're building precision mounts for nearly every major manufacturer of radar equipment–and many other component parts.

(Advertisement)

WHAT'S NEW
IN STEEL FROM STOCK

Now—Leaded Plates

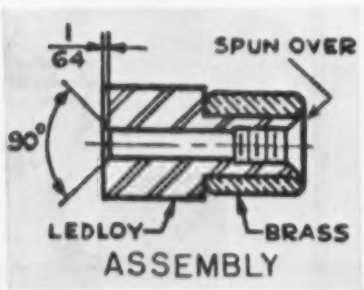
First stocks of leaded steel plates available anywhere are now on hand at Ryerson—and users are reporting results as remarkable as those achieved by thousands of companies with leaded steel bars. Tests show that New E-Z-Cut leaded plates cut faster, take a sounder weld, and polish to a high finish more readily than non-leaded



E-Z-Cut plates. And because sulphur content is much lower New E-Z-Cut is a much cleaner steel, free from troublesome sulphide stringers. First stocks include thicknesses up through 3".

Leaded Bars Make News

Ledloy from Ryerson attracted a good deal of attention at the Chicago Machine Tool Show this fall when three leading machine tool manufacturers chose this amazingly fast-cutting leaded bar steel to demonstrate the efficiency of their latest equipment. For example, the part shown here was machined from Ledloy and assembled with its brass ferrule at a rate of 200 per hour by one tool builder. And at the A.S.M. Show in Philadelphia machining demonstrations showed that the new Ryerson leaded alloy steel Rycut 40 in-



creases tool life up to 300% over non-leaded alloys in the same carbon range. For more details about these demonstrations, and for many other case studies, call Ryerson—where the nation's largest stocks of leaded carbon and alloy steels are available for immediate shipment.

New Fluid Power Tubing

Another development highlighted at the Machine Tool Show is the tremendous increase in hydraulic power applications. And because of this increase, the new Ryerson stocks of light-wall, pump-cylinder finish cold-drawn WELDED tubing should be of interest to a widening group. The special smooth I.D. of this welded tubing often makes it suitable for use "as-is" in place of more expensive types of tubing which still require extra finishing operations. Also in Ryerson stocks for hydraulic applications: Rockrite cylinder finish tubing and hydraulic fluid line tubing.

New Look for Steel Walls

Give steel-walled buildings new beauty with stainless steel siding in mansard pattern, now available for quick shipment from Ryerson. (Galvanized and carbon steel sheets are also available in mansard pattern.) Unusually attractive, economical in total area lost from pattern formation, maintenance-free stainless in mansard pattern also has many industrial and miscellaneous architectural ornamental applications. For new bulletin 70-5, write Ryerson, Box 8000-A, Chicago 80.

Aircraft Steels Specs

Just off the press, a new booklet entitled "Aircraft Steels" contains latest information, in condensed form, on Aeronautical Specifications—Military (MIL), Air Force-Navy (AN), Federal (QQ-S) and AMS aircraft quality steels. Also included is a complete listing of aircraft quality alloy and stainless steels available for quick shipment from Ryerson. To get your copy write Ryerson, Box 8000-A, Chicago 80, for booklet 93.

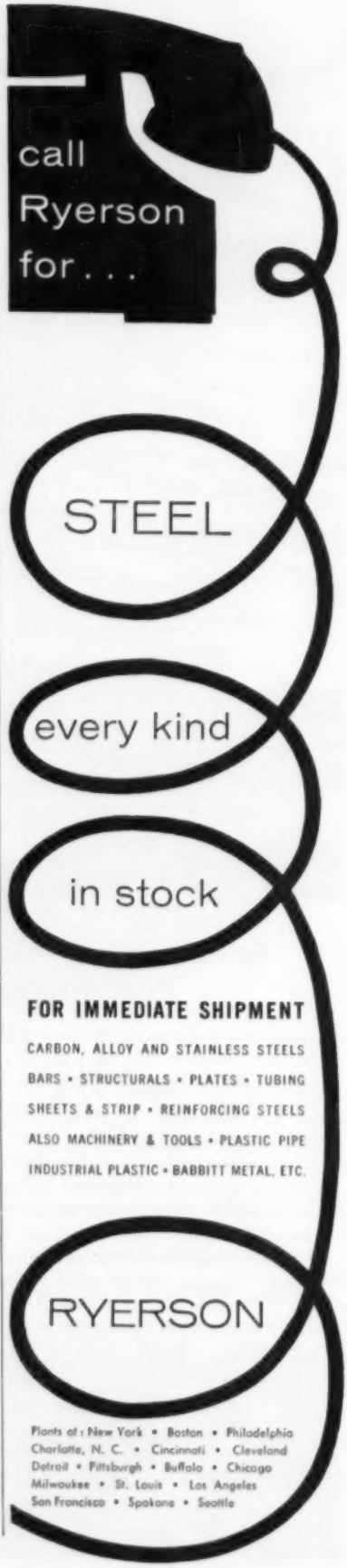
Biggest Stainless Plates

Now available from Ryerson stocks: 96" wide plates in thicknesses up through 1", and heavier plates in 80" widths. Types on hand: 304, 304L, 316, 316L. Save welding on next big job with these larger plates.

Carbon Bars, Plates, Shapes

Heavy demand is keeping supply out of balance from a size standpoint. However, we have thousands of tons of steel on hand and new tonnage being received daily. Ryerson stocks remain the world's largest and most diversified.

Joseph T. Ryerson & Son, Inc.


call
Ryerson
for . . .
STEEL
every kind
in stock
FOR IMMEDIATE SHIPMENT
CARBON, ALLOY AND STAINLESS STEELS
BARS • STRUCTURALS • PLATES • TUBING
SHEETS & STRIP • REINFORCING STEELS
ALSO MACHINERY & TOOLS • PLASTIC PIPE
INDUSTRIAL PLASTIC • BABBITT METAL, ETC.
RYERSON
Plants at: New York • Boston • Philadelphia
Charlotte, N. C. • Cincinnati • Cleveland
Detroit • Pittsburgh • Buffalo • Chicago
Milwaukee • St. Louis • Los Angeles
San Francisco • Spokane • Seattle

The Iron Age Newsfront

Steel Shooting For Record High

When figures for steel shipments in the first nine months of 1955 are totaled, they'll astonish even the optimists. Flat-rolled products will be at all-time highs—in some cases surpassing full year totals for 1954. Construction and automotive have been by far the biggest markets, and warehouses have distributed record tonnages. Cold-rolled sheet figures will even surprise the people who rolled it.

Watch Press Action On TV

A 35,000-ton forging press at Alcoa's Cleveland works is protected against off-center loading by use of industrial TV. Located in the press foundation, the camera watches a hydraulic mechanism which warns the operator of excessive off-center loading. If the operator does not act quickly enough, the press stops automatically. The idea behind it is to improve forging die design by charting causes of eccentric loading.

Sound-Dampening Move Starts

Watch for strong activity by producers of sound-dampening materials to get into the industrial field next year. This market potential is sparked by hearing loss legislation resulting in interest to reduce plant noise. Metalworking machinery, gear train housing, materials handling equipment are possibilities. Another potential market is in lightweight trains built low to the track with resulting high noise level.

Aim For Low-Cost Turbine Blades

Reflecting the wide gulf between goals and accomplishments was a statement made recently in Detroit that the auto industry is striving for gas turbine engine blades costing about 15¢ above the cost of the metal. The industry is looking for a low-cost iron-base alloy having no cobalt and little or no nickel.

Imports Affect U. S. Markets

Barbed wire is flowing into the U. S. from Europe in huge quantities. In fact, it appears that more imported wire has been sold in the Southeast this season than domestic makers there could produce at capacity. On the West Coast, Japanese nails have been a problem. Some steelworkers have already been laid off and more will be heard about imports in the future.

Architects Getting Color Conscious

Developments which have made it practical to apply color to metals for building purposes are being greeted enthusiastically by architects. Commercial buildings now on, and those about to go on the drawing board, are affected by the trend. Specifications call for some form of color other than that of the bare metal.

Talk Of Coke Shortage

Steel producers are concerned over a possible shortage of by-product coke. Oven rebuilding programs are being rushed to step up productive capacity. Wasteful beehive ovens can be pressed into service as a last resort, but mills are straining to avoid using these outmoded facilities.

New System Fights Ship Fires

A new fire-fighting system for ships, now under test in Great Britain, generates nontoxic gas from the combustion of diesel fuel. Gas containing approximately 14 to 15 pct carbon dioxide, with most of the balance nitrogen, is pumped into cargo holds with an inert gas in event of fire.

From One Improvement To Another

Introduction of pushbutton driving on 1956 cars has spurred engineers to look for other ways to improve automatic transmissions. Biggest field lies in simplifying the transmission itself, coupled with an increase in torque ratios.

WEIGH FIRST COSTS

of CMP restricted specification cold rolled strip steel

True costs of cold rolled strip steel are oftentimes clouded by unfamiliarity of the full potential with a specially tailored product such as CMP processes.

Typical of the reductions in overall manufacturing costs that can often be recorded with the use of CMP restricted specification strip, is the elimination of manual costs involved in the tear-down and re-assembly of components rejected for malfunctioning due to steel dimensional variations. Where precision fitting of components is essential to satisfactory equipment operation, the extra steel cost for close gauge accuracy is more than offset by greater parts production per machine hour and reduction or elimination of rejects at final assembly. Add to this the lower end product cost resulting from longer tool life, fewer coil changes on production equipment and other labor cost items.

The conclusion often is that it pays to buy a premium specification product to lower the cost of an end product employing cold rolled carbon, alloy or stainless strip steel.

CMP
WHERE YOU CAN GET SPECIFIC SPECS. FOR SPECIFIC JOBS

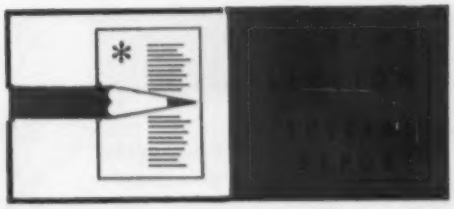
LOW CARBON
HIGH CARBON
Annealed or Tempered
STAINLESS
ALLOY
ELECTRO ZINC COATED

AGAINST CMP ADVANTAGES

the Cold Metal Products co.

GENERAL OFFICES: YOUNGSTOWN 1, OHIO

PLANTS: YOUNGSTOWN, OHIO AND INDIANAPOLIS, IND.
SALES OFFICES: New York • Cleveland • Detroit • Indianapolis
Chicago • Los Angeles • San Francisco



SHIPBUILDING: Is Rough Going Over?

U. S. yards now have substantial orders . . . But obstacles of high costs are difficult to overcome . . . Yards and operators depend on subsidies for survival . . . Defense big factor—By G. G. Carr.

◆ AFTER a long period of beating into the wind with bare masts, American shipbuilders are cautiously hoisting sails, preparing for smoother waters. But they are far from a snug harbor.

The weather really started to clear in the summer of 1954. That was the year shipbuilders almost built themselves out of business, with a record number of vessels completed. But the yards had received no new orders for almost two years. Then Congress authorized the Maritime Administration to start a $27 million repair program for the reserve fleet.

A trade-in and build program for private industry was passed. Military Sea Transportation Service was authorized to charter on a long-term basis 20 new tankers from private owners and to build seven special merchant ships. Maritime Administration was given funds for its share in four cargo-passenger ships to be built by Grace Line and Moore-McCormack Lines and authorized to go ahead with the conversion of liberty ships.

Orders Up

Pending shipbuilding projects (subject to Congressional approval in most cases) total 133 new ships and seven conversions for an estimated total gross tonnage of 1,531,000 and a dollar value of $1,307,574,000. In addition, foreign yards are so busy and their delivery times so long that domestic yard executives are beginning to talk of skimming off new orders if world-wide shipbuilding continues to rise.

As of the first of this month, American shipyards are working on orders for 23 major merchant ships totaling 294,800 gross tons, an increase of two ships and 36,400 tons over Oct. 1 and seven ships and 79,540 tons over Oct. 1, 1954. And yards can definitely look to contracts for at least 40 more ships of various types in the near future.

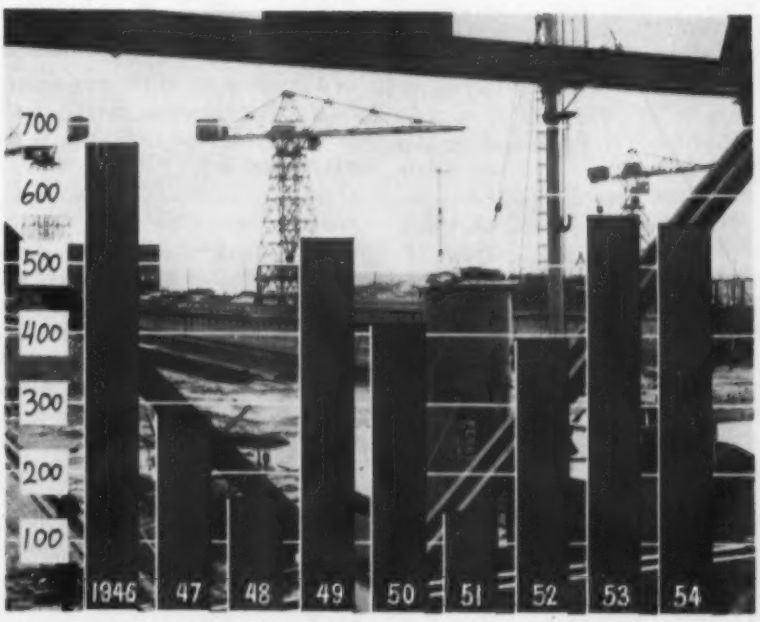
Navy orders to private yards are up too.

To an industry that went almost two years without a single order large enough to talk about, it's heartening. But no builders are firing any salute cannon yet. The orders actually placed have been disappointing—"Like throwing an anchovy to a starving whale" is the way one shipping expert described it. There have been heartbreaking delays, fathoms upon fathoms of red tape and—always in the background—political expediency.

"Probably the biggest headache in this business is the fact that nobody can predict the future ac-

U. S. Shipbuilding Trends

(Bars indicate Thousands of Tons)



tions and temper of Congress," one top shipbuilding executive told THE IRON AGE.

The hard fact is that American shipyards are, have been, and will be for the foreseeable future, almost entirely dependent on government subsidies and the disposition of Congress for their very existence. Ship operators cannot afford to buy and operate American ships without both construction and operating subsidies from the government. And these are frequently doled out piecemeal by Congress. Continuing appropriations for roughly the next 10 years will be the lifeblood of the Maritime Administration replacement program, for example.

Basic question is: "Who wants an American ship?" Answer: "Everybody—and nobody." American-built ships are as good if not better than any ships in the world —at a price practically nobody can afford to pay.

Quality vs. Cost

Quality is not beside the point. At least one much-touted foreign flag passenger ship has recently been withdrawn from service as unsafe. Excessive vibration and bad riding characteristics have made others nightmares to passengers.

But cost is the major factor. American labor and materials prices are geared to high-volume, mass production industries, which shipbuilding, despite valiant efforts by yard operators, definitely is not. Shipbuilding costs in this country are currently at least 40 pct higher than foreign competition. But there are indications that world-wide trends will, over a period of years, minimize the discrepancy.

Last month's agreement between Maritime Administration and Moore-McCormack Lines for two new cargo-passenger ships and a long-term replacement program highlights this cost disadvantage. The two ships will be 617 ft long, with a speed of 21 knots, have a gross tonnage of 18,200 and carry 553 passengers. Low bidder was Ingalls Shipbuilding Corp. of Pascagoula, Miss., at $24,444,181 per ship. Federal Maritime Board found the comparative foreign cost to be $14,680,000. The difference of $19,528,362 for the two ships will be paid by the government, plus $455,610 for special undescribed national defense features.

BIGGEST EVER: The S. S. World Glory, largest tanker ever built in the U. S., has a capacity of 16,614,696 gallons, made more than 17 knots in sea trials. Ship came out of Bethlehem Steel's Quincy yard in August, 1954.

Order Breakdown

A breakdown of current orders on hand at domestic yards reveals how dependent the industry is on government aid:

Of the 23 vessels now under construction or on order, 12 are being built by the Maritime Administration for the military, six are tankers granted subsidies under Public Law 574 (designed to encourage replacement of obsolescent vessels), two are tankers being built to permit the owners to transfer old ships to cheaper foreign registry, two are the Moore-mack passenger-cargo ships, one is a small ore carrier being built by Bethlehem Steel's Shipyards Co. for Iron Mines Co. of Venezuela, another Bethlehem subsidiary, and one is a passenger-auto ferryboat.

Shipbuilders' problems are inextricably linked with those of their natural best customers, American shipping lines. And their problems are the same: too high costs.

Sea Pay High

Operating costs of American flag ships are so much higher than for their foreign counterparts that under normal conditions free market competition is impossible.

Labor accounts for by far the largest share of the higher costs. Wages—highest in the world—are not the whole story. Our seamen eat better, live better and receive more welfare benefits than those in any other merchant marine. It all adds up to a staggering bill, to which costs as fuel and maintenance are trivial.

To avoid these high operating costs, many American shipowners have until recently been transferring their ships to foreign registry.

Four hundred and eighty-two were transferred since World War II, plus 1862 sold by the U. S. Maritime Administration. But this is now generally forbidden by law, unless the owner agrees to build, with government assistance, new ships to replace those transferred.

There are highly vocal and persuasive groups insisting on our need for a strong merchant marine. Defense and international prestige are the main reasons usually advanced. But shipping men admit privately that, defense aside, our merchant marine is a very expensive luxury. Even in the all-time boom decade 1938-48, ship operators needed $35,515,000 in operating subsidies to stay in the black.

Most solid argument advanced by merchant service advocates is defense, and the most popular. Shipping needs soar in wartime, and many experts believe a big ship reserve and a healthy shipbuilding industry are as essential as ammunition for security. Others, however, feel we would get more for our defense dollar by helping friendly foreign powers build up their merchant fleets. These, it is claimed, could be pooled in time of war.

Foreign Aid

("But who knows who our friends will be ten years from now?" asks one leading shipbuilding executive. It is pointed out that ship pooling agreements have been invalidated in two world wars.)

This second group argues further that ocean haulage is a fine way for foreign countries to earn badly-needed dollars. As it stands now, they frequently must spend them on American freight rates. The law, for example, requires half of all foreign assistance shipments to travel in American registry ships.

The shipping picture is not quite so black for shipbuilders as for ship owners. To qualify for operating subsidies, American ship lines must have their ships built in American yards. The Maritime Administration pays the cost difference between U. S. and foreign yards up to 50 pct of the cost of the ship. In addition, government regulations require that all domestic lake and river traffic, and ocean traffic between U. S. ports, travel in American-built bottoms under American registry. On a worldwide basis, the U. S. is tenth in number of merchant vessels under construction and tenth in tonnage.

Out of Business

This is in sad contrast to the peak year of 1943 when American shipyards delivered 1,661 merchant vessels with an aggregate tonnage of 12,499,873 gross tons. After the war, the industry was virtually out of business. No American flag operator was interested in constructing new ships. War-built bottoms were going at bargain rates under the Merchant Ship Sales Act of 1946. The government had a surplus of both merchant and naval vessels, had no interest in buying new ones.

There did, however, develop a worldwide demand for tankers. American yards received substantial orders from both foreign and domestic buyers. And Korea brought the government program for high-speed, military type cargo vessels, the *Mariner* class. Large yards, the only ones capable of handling that type of construction, were running at a good rate.

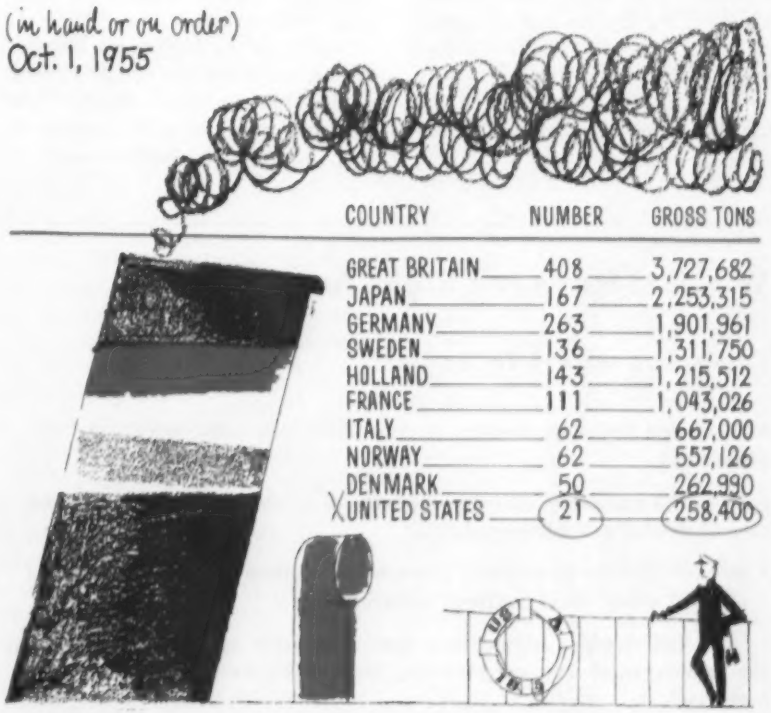
But eventually even those two programs ebbed. No new orders were placed with American shipyards for almost two years. And foreign yards were recovering from war damage. Japan and Germany came back strongly as marine centers.

By 1954 the situation was so serious that government action was essential to retain a nucleus of skilled workers and adequate shipbuilding facilities.

The Congressional authorizations to date have totaled 59 vessels. Shipbuilders say 60 ships a year are needed.

Metalworking's stake in shipbuilding's future is enormous. The *S.S. Independence*, one of our most modern but by no means largest ships, required 18,545 tons of iron and steel. Over 800 companies, almost all metalworking firms, supplied components for the *S.S. United States*. American Iron and Steel Institute reports shipbuilding and marine equipment last year accounted for over 500,000 tons of finished steel shipments. In the peak year of 1943, the figure was 11,509,000 tons or 19.2 pct of all steel shipped.

In the World's Shipyards



BUSINESS

GM: What's Behind Congress Probe?

Democrats hope to make big business campaign issue . . . Set four weeks for hearings instead of usual few days . . . Seek to establish link with Administration . . . Probe supplier relationships.

◆ WHAT'S REALLY behind the new congressional investigation of General Motors is a carefully-planned political drive against all "bigness" in business.

Senate Democrats now piloting the GM probe confidently expect to strike political paydirt in the weeks ahead. It's no coincidence that they (1) decided to probe big business as the national political campaigns are getting under way, or that they (2) set aside four weeks for public hearings instead of the usual few days, or (3) that they have installed veteran investigator Senator Joseph O'Mahoney, D., Wyo., as chairman of the probe.

Wants Split

Senator O'Mahoney has a long record of opposing the "bigness" of such corporations as General Motors, U. S. Steel, and General Electric. He has openly suggested on many occasions that these corporate giants ought to be forcibly split up into separate firms. His pet theory for regulating all incorporated business in the U. S. is to establish a federal commission empowered to "charter" all firms operating in interstate commerce (meaning, in these times, almost 100 pct of all business and industry).

Administration Link

Importance of the GM probe lies not only in what you'll hear and read in daily newspaper and TV reports in the weeks to come. This is a long-range political plan to (1) holler up the "evils of big business," and then (2) to link up in the public mind the Eisenhower Administration with all big business.

No one will deny that GM is a big operation. It makes just about everything from locomotives to nuts and bolts. Its third quarter report shows that sales for the first 9 months of 1955 were well over $9 billion.

The question before the Senate is how much the size of GM affects competition in the country. The subcommittee wants to find out if GM is stifling competition and is in a more advantageous position to get raw materials from its suppliers.

It's true that General Motors' size affects competition but not in the way most people think. There isn't an auto producer that isn't doing its best in hope of luring some of GM's customers away.

This has literally forced the competition to improve its products. In some cases, it has worked.

Chrysler Corp. is the most outstanding current example. Chrysler literally picked itself up by its bootstraps this year and has reclaimed its place in the market at the expense of both GM and Ford sales.

The Independent producers find it harder to compete with General Motors and other members of the Big Three, but so far they have survived through mergers and aggressive engineering and merchandising.

Financial Interests

As far as General Motors' relations with its suppliers are concerned, the corporation does have financial interests in some of its supplier companies. In steel, for example, GM had loaned money to at least two mills.

But the company is too big to get all its steel from one place and is obliged to scramble for the metal just like any other producer.

Once GM tries to rest on its past record, some other company will take the corporation's place as the nation's leading producer.

But this is no "small potatoes" investigation. Political impact of the "GM spectacular" being staged four days a week (Tuesdays through Fridays; matinees daily) for the next three to four weeks is going to figure largely in the campaigns of both parties.

Will GM Have the Right Answers?

Congress wants to know:

- **Does GM force its dealers to buy unwanted cars, parts and accessories?**
- **Does the company exercise dictatorial control over the type and size of dealer establishments?**
- **Does it dictate to dealers' accounting methods, advertising practices and other local business practices?**
- **Are GM dealers little more than economic vassals, existing at the pleasure of the corporation, with little to say in important matters?**

FASTENERS: An Old Problem Is Licked

Industry simplifies pricing system and adopts uniform packaging method . . . No overall price change involved . . . New system expected to cut training time for billing clerks by 50 pct—*By T. M. Rohan.*

◆ PRICING CLERKS in industrial fastener plants have often wondered whether the discounts they had to figure outnumbered the nuts and bolts the factory was spewing out.

Working from 1927-32 era price lists—with discounts adjusted over the years for changing costs of materials, labor, new machinery, taxes, etc.—they waded through 36 possible discounts for any given group of common bolt products. And there are 30,000 to 40,000 possible increments.

But that's a thing of the past. The industry generally has adopted a radically revised and simplified pricing system.

The 36 possible discounts are lumped into four groups. Discounts are changed from a base price and 40,000 lb price to case basis and 20,000 lb carload price. The list price and total discounts have been raised proportionately. Distributor warehousing and handling discounts have been revised and an industry-wide uniform packaging system developed by Industrial Fasteners Institute in Cleveland has been adopted.

The new pricing system results in no overall price change. Some were raised by a fraction and some lowered. The big difference will be in simplified pricing within producer companies and to a greater extent within distributor organizations.

Behind The Change

Lamson and Sessions, which was the first to announce the new schedules after two years of work, told the IRON AGE it will cut the training time for billing clerks by at least 50 pct. The firm also expects the same would apply to their customers, the distributors and carload class buyers.

Because actual prices had gone so far over the outmoded base prices, there was a plus "discount" of up to 25-30 pct by the time fasteners arrived on the hardware dealers shelf. And boltmakers concede that the new pricing system resulted to a large extent from pressure from the distributor level.

"It just isn't good business practice to quote an old list price and then end up with a plus discount when calling on our hardware dealers," says one distributor.

Packaging Improvements

One of the major improvements in bolt manufacture which helped obsolete the old price list was the boltmaker introduced about 10 years ago and improved since. Formerly the making of a machine bolt involved feeding coil stock into a cold heading and cutting machine to produce a blank. This was trimmed on another machine and then sent to a third machine for squaring the head. An extrusion process followed this to reduce the diameter to be threaded. In still another machine the bolt was pointed and roll threaded.

Now it is all done automatically in a single machine. Capital investment is higher but productivity is way up and in-plant handling costs are drastically slashed. Some of the limits of cold heading have also been raised through better materials, widening the range of sizes possible by this method.

On packaging, a survey by the Industrial Fasteners Institute revealed that of 17 major U. S. producers, no two were using the same case. And among the 17, there were 214 different cases in use.

By actual test packing, a series of cartons were determined which would contain round numbers of bolts such as 25, 50 and 100. Any of these cartons will nest neatly within the minimum dimensions of the case.

Home Credit May Ease

Federal housing officials are showing some signs of worry over the effects of recent restrictions placed on home mortgage credit. Housing starts have slipped in two of the three months since they were imposed.

Now, the government says officially that it will "unquestionably" junk the credit curbs on housing if the drop-off continues.

If it is decided to ease the terms, the mortgage time will be extended —back to 25 and 30 years—before the down payment requirements are reduced to their old levels. Down payment requirements were raised by 2 pct in the action.

Housing starts dipped in July; recovered in August as home buyers, fearing further controls, rushed to buy, and then fell off 8 pct in September.

Homebuilders are arguing that the restrictions will prove "disastrous" to the housing boom if continued very long. They want the government to restore the old terms before the normal spring housing push.

Government spokesmen won't say at what point they may act to ease the home buying terms. But there is a good chance that they will take some easing action before next spring.

ZINC: First Million Ton Year In Bag

Total consumption in first half of 1955 tops same period 1954 by 28 pct . . . Demand stays good . . . Industry expects this to be its first million ton year . . . Diecasting registers biggest increase.

◆ THE ZINC industry is headed for its first million ton year. Industry sources expect consumption in 1955 will hit 1.1 million tons compared with the previous record of 985,927 tons established in 1953.

All of the major zinc markets have a record year in the offing.

During the first half of the year 536,373 tons of slab zinc were consumed by industry with no letup in demand expected.

Diecasters Active

Zinc diecasting is particularly active. During the first half, diecasters used 29 pct more zinc than in the comparable period in 1954. Automotive manufacturers are the big customers. They use zinc diecastings for trim, moldings, door handles, grilles, instrument panels, carburetors and window frames. Their activity can be used to forecast cast conditions. The drop in auto production in the third quarter will undoubtedly cause shipments and consumption to lag. However, since auto production is expected to hit its yearly high in the fourth quarter, this lag could be made up.

With demand growing in fields of appliance parts, machine components, radio and TV escutcheons, hardware and aircraft components, diecastings are expected to account for the biggest increase in zinc consumption.

On the assumption that the big automotive fourth quarter will at least partially offset the slower third period, over 380,000 tons of zinc are expected to wind up in the form of diecastings.

This will exceed the 1954 consumption by better than 100,000 tons. Total zinc used in diecastings and galvanizing makes up over 80 pct of the zinc market.

Galvanizing activity is almost matching diecasting in increased activity and accounts for greater tonnages of slab zinc.

Galvanizing Technique

A big factor in pushing galvanizing to record zinc consumption is the steady increase in the use of the new continuous hot dip galvanizing lines. This method produces a superior galvanized product more suitable for stamping, drawing and forming because of the better adherence of the coating to the base steel. It has opened up the possibility of many new markets. For example, coiled sheet galvanized by continuous hot dip method is becoming popular for continuous feeding into automatic machines.

Lion's Share

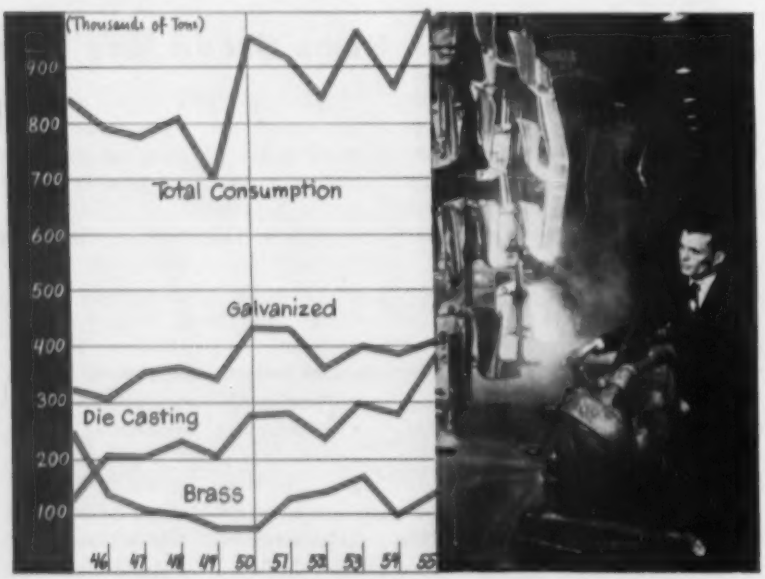
Present annual capacity of hot dip galvanizing lines of 1.7 million tons is expected to be increased by about 823,000 tons in the near future by new lines planned or already under construction.

Taking into consideration current and expected operations, the end of 1955 should see consumption of zinc by the galvanizing industry run to about 430,000 tons.

The lion's share of this production, about 190,000 tons, will be accounted for by sheet and strip. Tube and pipe fittings will consume about 90,000 tons, wire and wire rope another 50,000 tons, and job shop galvanizers an important 90,000 tons.

Current boom in the construction industry has increased the demand for galvanized sheet, especially in the light of production and technical advances. Duct

Slab Zinc Shipments



work, metal roofing and siding, smoke pipes and elbows and gutters are some of the applications for which the construction industry uses the improved galvanized.

Brass Demand

Hurricane Diane and the strangling copper supply considerably harassed the brass manufacturers in New England. This had the effect of minimizing the amount of zinc that would have been demanded by the industry. However, the demand for brass, particularly for bearings, castings, forgings, electrical parts and plumbing supplies, approached that of copper. The brass mills out of the Naugatuck valley, unaffected at least by the hurricane and drawing some copper from crippled Conn. mills, stepped into the breach, worked around the clock in order to meet at least essential demand and have been using zinc well in excess of the 1954 rate. With no further natural interference, the brass mills will consume in the neighborhood of 145,000 tons of zinc.

Construction

The prospering construction industry, in addition to supplying impetus for galvanized sales, pushed consumption of rolled zinc to a position where it is a certainty to top 1954, even considering the expected lag in construction during the winter months. In addition to the usual usage for weather stripping, roof valleys and flashings, gutters and downspouts, roof drainage fittings and terrazzo strip, the builders have found a method for using high purity cast or rolled zinc as anodes for cathodic protection of steel.

Bare steel in contact with water or moist soil has a natural tendency to rust. When zinc anodes are electrically connected to the steel the zinc is sacrificed but the steel resists rusting.

Despite the spurt by construction firms, the manufacturers of dry cell batteries continue to use the greatest tonnage of zinc in the form of sheet, strip and plate.

In effect, any industry which has been using zinc in the past will use more zinc in 1955. Radio and TV manufacturers are using more extruded rolled zinc for cans for condensors and shield tubes.

The printing industry is using substantial quantities over 1954 totals for photoengraving and lithographic plates.

Paint manufacturers are using more zinc oxide in their production of outside house paint (for its durability and color retention) simply because they are making and selling more paint. The same is true of interior gloss enamels which use the zinc oxide for its fade resistance; and metallic paints which use oxides, chromates and metallic dust to inhibit corrosion.

The total zinc consumption picture is actually brighter than the expected million ton year indicates. Materials from ore and residues and secondary sources are not considered in this calculation. The chemical industry will undoubtedly use more zinc from this source than the 311,000 tons in 1954.

NORTH POLE military installations, where temperatures run as low as 50 degrees below zero making maintenance difficult, use 10 gage multi-plate galvanized steel culvert pipe to construct their buildings.

Trade:

U. S. plans eased rules for shipments to Reds.

Exports of non-military goods to Communist countries may soon be made without a government license.

The easing of export rules was ordered by Commerce Sec. Weeks.

In general, the revised rules—which will go into effect before the end of the year—permit the export without license of all goods which now may be exported under specific license arrangements. Nearly all so-called "peaceful goods" are included in this list.

But products and commodities that have any military or strategic connotation still are not eligible for export under any conditions.

Examples of goods which may be freely exported without government license soon: Passenger automobiles, farm machinery, hides and skins, wool rags, tobacco, tallow, phosphate rock, rosin.

Principal effect of the relaxation is to free exporters from the burden of applying to the U. S. Department of Commerce for export licenses.

In actual practice licensing for non-military goods was red tape since permission in most cases was not hard to obtain.

TRANSPORTATION

AIRBORNE: More Cargo Goes By Air

Air cargoes run about 40 pct over last year . . . Lines race to build bigger, faster fleets . . . Metalworking items lead wide range of products shipped . . . Air supply reduces warehousing—By *K. W. Bennett.*

◆ FROM BULLION to bodies air freight lines are shipping more in 1955 than any previous year.

Air freight business was up at least 25 pct in the first four months of 1955 (IRON AGE, June 9, 1955), is 35 to 40 pct ahead of last year at this point. And the busiest months, November and December, are still ahead.

International air freight estimates as to the increase range to 65 pct over the year ago period. Conservatively, air freight will haul 388,072 tons of cargo this year.

Metal Products Lead

Product range is wide. Race horses and steel bars bulk heavy in one line's tonnage. But machinery and machine parts lead.

Sky movement of metalworking equipment or products is part of the answer to the feverish scramble for aircraft by the air freight lines. Slick Airways, United, Flying Tigers, and American are representative of the race to build bigger air fleets that fly faster.

Flying Tigers put 10 Super Constellations on order recently to cut trans-U. S. schedules by 3 hours when in service.

Slick has purchased five. United has thirty DC8 jet transports on order for 1959 delivery. United planes will carry a passenger complement plus 7000 lb of cargo. The same line has 15 new DC6A's coming on for straight cargo work, plus another 15 passenger-cargo combinations.

The movement is not limited to domestic cargo.

Pan American World Airways, biggest of the intercontinental haulers of air freight, opened the year with one transatlantic cargo run, began scheduling six weekly flights in August, and a few weeks ago began scheduling 12 weekly cargo flights.

What They Haul

One line has been hauling 7000-lb titanium ingots. Bars in diameters from 1-2 in. and lengths to 14 ft are moving by air in lots of 50 to 8000 lb. Machine tools, oil well machinery, are moving by air.

To South America and to a lesser extent to Europe, juke boxes and slot machines are a brisk item. So are appliances, as refrigerators and stoves. A number of U. S. firms now air freight the household furnishings of executives newly assigned to their South American branches.

What will they haul? One line argues it will take anything that will go in the door of the plane. Others put a 6000 lb per item ceiling. A combination passenger-cargo plane will handle 5000 to 8000 lb, depending on the model.

A full cargo plane can load 30,000 to 32,000 lb. The Super Constellations, when in service, may go up to a 42,000 lb payload. A transport can load somewhat more than the cubic footage of a boxcar, about 5000 cu ft.

Emergency shipments are no longer the skyhook keeping air freight aloft.

Airlines are having increasing success in selling the potential customer on reducing his scattered inventories of spare parts.

BIG HAULER: Wide variety of freight goes into Pan American World Airways ship. Biggest intercontinental hauler of air freight, Pan American had one transatlantic cargo run at the year's start, now has 12 flights.

DRONE: Brings Back Candid Shots

Pilotless plane takes still or moving pictures . . . Operates at high or low altitudes in ground-controlled flight . . . Catapult launching, parachute landing eliminate need for airfield . . . Tactical weapon.

◆ ARMY ground commanders can now get air photos of enemy territory in a hurry. A new pilotless plane takes still or moving pictures, flies up to 4 miles altitude, needs no special airfield.

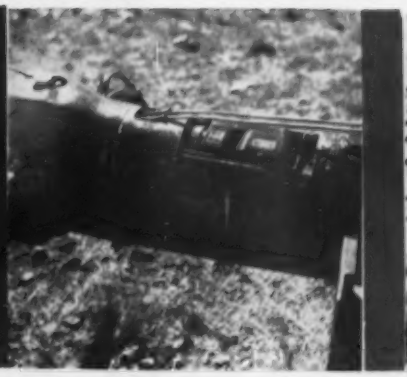
The RP-71 drone takes off from a catapult with the aid of a jet boost. Once aloft, the drone is powered by a conventional propeller at speeds up to 228 mph.

The ground unit guides the RP-71 to enemy lines. There pictures may be taken from a few hundred feet up or from 4 miles high. Then the drone returns home, where the motor is stopped and the craft is brought to earth by a parachute. Designed for use with tactical units, the drone can operate in practically any terrain.

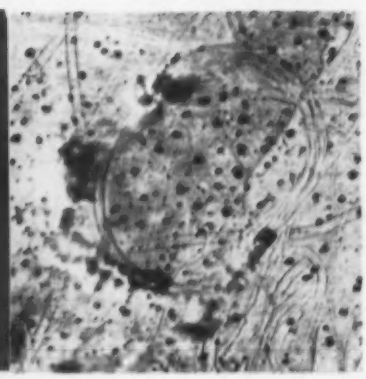
SEEING EYE: New pilotless plane, Army's RP-71 drone is shown on launching catapult at Fort Huachuca, Ariz. Designed to provide ground units with air reconnaissance, the camera-carrying drone takes still or moving pictures.

JET ASSISTED take-off sends RP-71 drone off at 85 mph. The drone climbs at 3060 ft per minute, has a top flying speed of 228 mph.

OPERATOR works "joy stick" to control flight of camera drone.



DRONE CAMERAS are started from the ground, take still or moving shots.



DRONE PICTURE, taken from 800 ft, shows tanks, truck tracks, shrubs.

PRODUCTION

FREIGHT CARS: Outlook Bleak

Builders operating at only 50 pct of capacity . . . More cars scrapped than built . . . Shippers desperate for rolling stock . . . Order backlog will reach 100,000.

◆ THE FREIGHT car shortage will get worse before it gets better.

Hampered by lack of steel, plus other problems, car builders are operating at roughly 50 pct of their capacity. New car deliveries are running at an annual rate of approximately 40,000 cars, compared with productive capacity of about 100,000.

Actually, the nation's freight car fleet is dwindling. In first nine months of 1955, old cars scrapped exceeded new units by 33,255, according to American Railway Car Institute.

Customers Hurt

Meanwhile, shippers are suffering. The coal industry, enjoying one of its biggest booms in years, can't get enough cars to ship what it's producing. Steel mill traffic departments are working overtime to round up cars, are patching up "bad order" units to make them serviceable. Metalworking plants are resorting to cloak and dagger tactics to ferret out cars.

Unofficial estimates are that industry generally is running into shortages of approximately 20,000 cars per day despite railroad efforts to speed up loading and unloading to keep cars in service.

Backlogs Climb

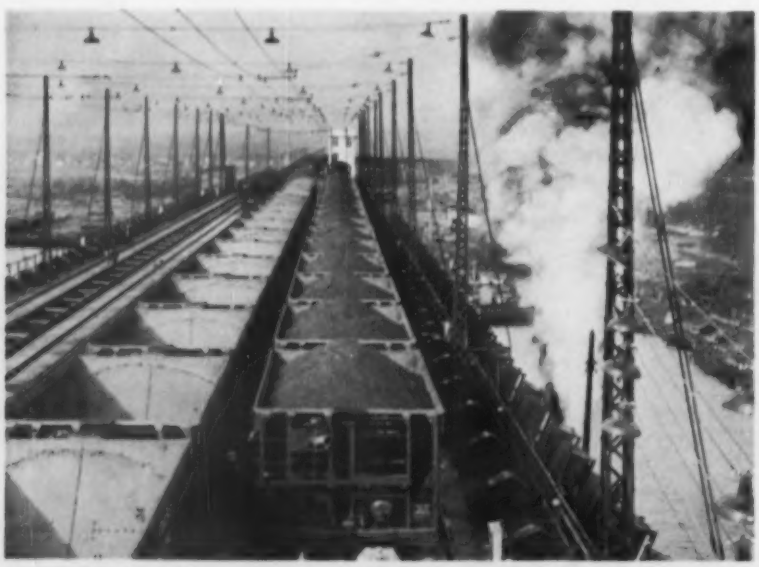
Freight car order backlogs are building up. On Oct. 1, the backlog stood at 52,913. By the end of the year it will reach 100,000. One reason: Office of Defense Mobilization's year-end deadline on rapid tax write-offs for freight cars.

New York Central is placing $117.8 million in orders for 14,750 cars. Other new orders will be placed soon.

Industry will be struggling with the freight car problem for years. Even if the builders were operating at capacity, the net gain to the nation's freight car fleet would be small. Meanwhile, the expanding economy is making heavier demands on the available rolling stock.

William Faricy, of the Association of American Railroads, says industry will need 350,000 new cars in the next five years, an average of 75,000 per year. With retirements running at an annual rate of 60,000 or more, this would mean a net gain of only 15,000 cars. To reach the goal mentioned by Mr. Faricy, well over 100,000 cars per year would have to be built.

Thus the railroads can not hope to get enough cars to alleviate the current shortage until the freight car builders are able to produce at a rate somewhere near their capacity.



WITH RAILROADS running over 20,000 cars per day short, the ore cars on the left won't be empty for long. Both industry and the railroads are trying to speed up cargo handling as a step in the right direction.

Order Medium Tanks

Production of tanks for the Army moves ahead at a reduced rate with the awarding of a $73 million contract for M-48 Patton medium tanks to Alco Products, Inc., Schenectady, N. Y.

This is the only tank contract to be placed in this fiscal year, the Army says. Tank procurement is being noticeably slowed down. The previous order, placed more than a year ago, was a $160,601,200 contract with Chrysler Corp.

Reason for the slow-down in tank procurement is the fact that the Defense Dept. is placing marked emphasis on new weapons like guided missiles and atomic devices. But the new tank contract with Alco will keep the production lines operating, thus assuring at least a running start in case of emergency.

Inventory:

Defense Dept. finds holdings total $124 billion.

Enormous property holdings of the armed forces are given an estimated value of about $124 billion in a new Defense Dept. report to Congress.

Included in this inventory, the first presented in response to orders from the lawmakers six years ago, are real estate, miscellaneous supplies and equipment, and weapons.

Real Estate Leads

Even though the estimate was a long time in preparation, it admittedly has shortcomings, partly because original acquisition costs are given for much of the fixed property.

For example, some of the Army real estate in urban areas such as Washington and New York is shown at either pre-1800 prices or at no government cost at all. In addition, the 125 defense plants in the national industrial reserve, valued at almost $1.5 billion, are omitted because they are not now under military management though the Defense Dept. would control them in an emergency.

Major categories in the inventory are real estate, valued at $21.5 billion; supplies and equipment, $99.5 billion; and machine tools, nearly $2.9 billion. Real estate owned by the military departments amounts to 29.4 million acres, 82 pct of it in the continental U. S.

Navy Well Equipped

Biggest property holder is the Air Force, with 15.3 million acres valued at $5.7 billion. Army and Navy, with 9.8 million and 4.3 million, have less acreage, but they place a higher valuation on their real estate. The Army share is figured to be worth $8.3 billion and the Navy $7.3 billion.

Kingpin in the supplies and equipment category is the Navy, with 2724 active and reserve ships valued at $22.2 billion. In all, the Navy has $30.1 billion worth of equipment in combat units and $17.8 billion in depots and supply channels ("pipelines").

Air Force owns $14.4 billion in the hands of its units and $12.2 billion in depots and pipelines. Army has most of its equipment, $20.8 billion worth, in depots and pipelines and just less than $4 billion in its units.

SUPERSONIC aerial photography is the mission of the RF-101A Voodoo, built by the McDonnell Aircraft Corp. One of the World's fastest photo-reconnaissance airplanes, it is now undergoing Air Force tests.

Harness Helicopters

Navy has a new scheme for teaming up helicopters to lift a load which would be too heavy for one of them alone by means of a rigid metal harness.

The harness keeps the three whirlybirds separated, but permits them some freedom of movement. It would be used for crane-type jobs, such as lifting heavy machinery, bridge sections, or lengths of pipe for short distances —weights up to about 4000 lb.

Two, three or possibly more helicopters, each with its own pilot but under some control of a command pilot, could be hitched together. The command pilot could steer the whole group by manipulating hydraulic controls that change the angle of the rotors. Individual pilots control the verticle flight under directions from the command pilot.

Build Super Sabers

Two plants of North American Aviation, Inc., now are turning out the F-100C Super Sabre, one of the Air Force's newest jet fighters.

North American, which has been building the supersonic plant at its Los Angeles facility, has newly begun producing them at Columbus, O., also. Production began at Columbus approximately one year after the disclosure that the company would build the planes at a second plant.

Test Warning System

The government's civil defense brass hats will soon test a new device which should permit many men to breathe a little easier while they're away at work — a home warning signal system.

The new system, said to be inexpensive and capable of alerting 99 pct of the population, will be tested in an unnamed Western community soon. If successful, it will be tested in large cities, and if still successful, CD hopes to have every home equipped within several years.

Principal advantage of the new device is that it would supplant—but not replace—sirens and radio broadcasts in rural areas.

EXPANSION IN INDUSTRY

Inland:

Capacity to be boosted 15 pct in three years.

The Inland Steel Co. is set to spend $260 million over a three year period to boost their steelmaking capacity by 15 pct. This would add 800,000 tons of steel ingots to their annual production and bring their rated capacity to six million tons by 1959.

Most of the expenditures will go to increase and improve the facilities at the East Chicago, Ind. plant.

Three new 315-ton open hearth furnaces will supply most of the increased tonnage. The rest will be the result of improvements in existing furnaces and production techniques.

In order to handle the additional capacity a new blooming mill will be installed. Initially it will be able to handle 1.8 million tons of ingots annually. Since this is twice the expected increase in capacity it will serve to take the strain off existing units.

A new cold rolled sheet dept. will be capable of turning out 485,000 tons per year when it goes into full production by January 1959.

The expansion program also calls for improvements that will increase capacities of hot strip mills, and continuous normalizing line for enameling sheets.

The company expects to require 1750 new workers to operate the expanded facilities when they are completed.

$65 Million Program

Wheeling Steel Corp. intends to spend $65 million on their Ohio Valley plants at Steubenville, Mingo Junction and Yorkville, Ohio, and Benwood, W. Va., for additional steel making facilities.

The aim is to supplement present open hearth furnaces and eventually replace the currently used Bessemer converters. Some net increase in steelmaking capacity is expected, but more important is the fact that the steel produced by the new facilities is expected to be of sufficiently good quality for deep drawing.

Consolidation

Barium Steel Corp. has consolidated its steelmaking facilities under the management of Phoenix Iron & Steel Co., Phoenixville, Pa. These facilities will operate as divisions of Phoenix Iron & Steel: Platt Div., Harrisburg, Pa. (formerly Central Iron & Steel Co.); Blast Furnace Div., Chester, Pa. (formerly Chester Blast Furnaces, Inc.); Structural Div., Phoenixville, and Phoenix Steel Tube Div., Phoenixville. This integration has been brought about to increase efficiency and services of the company.

WORLD'S largest rock crusher is part of the Reserve Mining Co.'s works at Babbitt, Minn. The giant machine pulverizes hard taconite at a rate of 60 tons per minute. It weighs 1,250,000 pounds.

Expansion Briefs

Carpenter Steel Co., Reading, Pa.; increase melting capacity 20 pct; improve existing facilities; Alloy Tube div., Union, N. J.; Webb Wire div., New Brunswick, N. J.; five year program; $9 million.

Ford Motor Co.; 600,000 sq ft parts mfg plant; Ypsilanti, Mich.; completion summer 1957.

Fansteel Metallurgical Corp.; new building and production equipment for tantalum-columbium; Chicago, Ill.; $1 million.

Kaiser Steel Corp.; exercising its option for purchase of undeveloped limestone deposits in S. Calif.; $1 million.

J&L cold drawn ELECTRICWELD tubing now available with a superior SPECIAL SMOOTH I.D. finish

Reduces your over-all production costs in applications like these . . .

- **cylinder tubing**
- **hydraulic and pressure tubing**
- **shock absorbers**
- **ordnance components**

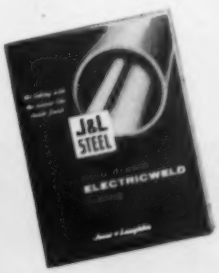
This new drawn-over-mandrel grade tubing with its mirror-like inside surface finish is today busy helping manufacturers reduce or entirely eliminate costly machining on many applications and is being substituted for more costly types of steel tubing. For example, it may be used, without inside honing, for many cylinders through which plungers are passed.

J & L Cold Drawn ELECTRICWELD Tubing with a *Special Smooth* ID finish combines the physical advantages imparted by today's modern electric welding techniques with those of cold working. It withstands high internal hydrostatic pressures, carries heavy torsion loads, resists high-frequency vibration, and offers a favorable weight-to-strength ratio for applications in which loading occurs in all directions.

J & L Cold Drawn ELECTRICWELD Tubing can be furnished in its three specifications in OD sizes from ¾-inch to 2¼ inches and in wall thickness from 20 to 10 gage, 0.035 and 0.134-inch respectively.

This new booklet provides the information you need . . . specifications . . . tolerances . . . chemistry . . . mechanical properties . . . annealing . . . finishes.

J&L STEEL



Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

Send for your free copy today!

Jones & Laughlin Steel Corporation
Dept. 403, 3 Gateway Center, Pittsburgh 30, Pa.

Send me a copy of your new Cold Drawn ELECTRICWELD booklet.

NAME_____

TITLE_____

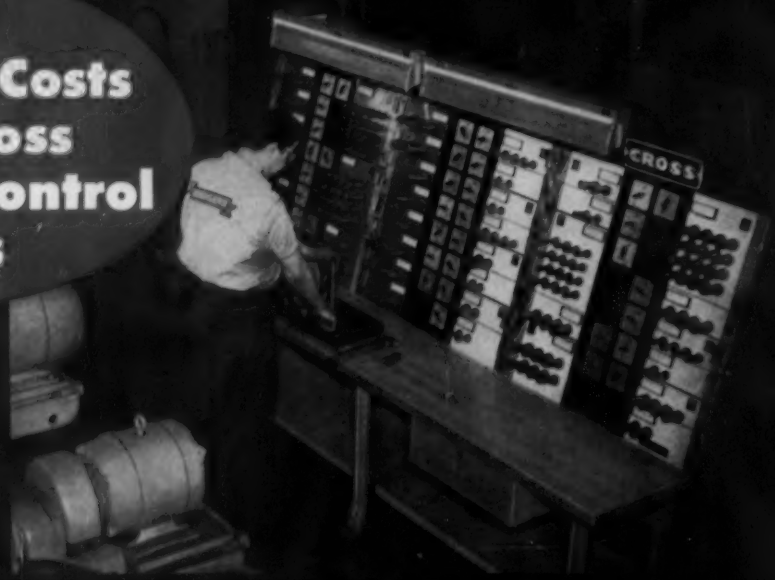
COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

A Mechanical Eye...

Ford Cuts Tool Costs with Cross Machine Control Units



One of the Cross Machine Control Units at Ford Motor Company's Cleveland Engine Plant

U. S. Patent Nos. 2679038 and D-163935. Others pending.

According to records, 221 Cross Machine Control Units in operation at Ford Motor Company Plants are assisting them greatly in improving tool trouble conditions.

One reason for this is that the Machine Control Unit provides a definite and convenient place for storing tools . . . tools which are pre-set so they can be placed in operation immediately without making machine adjustments.

Another reason is that the Cross Toolometer, an integral part of the Machine Control Unit, provides a standard for the performance of the tools, thereby enabling corrective action to be taken when necessary. The Toolometer dial is set to indicate the number of pieces which a given tool should produce. When the dial has reached that pre-determined figure, the machine automatically shuts down and the tools are changed. At the same time, other tools indicated by the Toolometer as approaching the end of their usefulness are also changed to take full advantage of the machine shut down.

The Cross Machine Control Unit is helping to keep Ford production going and is also assisting greatly in controlling tool life.

See us in Booth No. 1118 at the Machine Tool Show

Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

YOLOY E

is backbone of

OPERATION "PIGGY-BACK"

THE YOLOY FAMILY

High in resistance to corrosion, shock and vibration, easy to fabricate, easy to weld.

YOLOY
(Nickel-Copper)
High Strength Low Alloy Steel

YOLOY E
(Nickel-Chrome-Copper)
High Strength Low Alloy Steel

These extra long specially equipped flat cars are the Pennsylvania Railroads new Truc-Train cars designed to haul two fully loaded highway trailers. To reduce dead weight, The Pennsylvania used Yoloy E steel to withstand the heavy concentrations of loads encountered in the long spans between truck center plates.

Yoloy E, The Youngstown Sheet and Tube Company's high strength low alloy steel is made to order for problems such as this. It has a high strength to weight ratio for stronger construction without increasing weight. It is easy to weld and fabricate. Yoloy E will also last many times longer than ordinary steel in atmospheric corrosion and is high in resistance to abrasion and wear.

There is a Yoloy steel to solve your construction problems—write or call your nearest District office for full details.

Youngstown

QUALITY YOUNGSTOWN SERVICE

THE YOUNGSTOWN SHEET AND TUBE COMPANY — *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

WEAN EQUIPMENT CORPORATION
22800 LAKELAND BOULEVARD
CLEVELAND-17-OHIO

REPLY TO
22800 LAKELAND BLVD
CLEVELAND 17, OHIO

WARREN OFFICE
347 N. PARK AVENUE
WARREN, OHIO

A letter of interest to Every Press User!

Dear Sir:

During the last year our company has developed a new press of revolutionary design.

We have conducted a series of tests on this machine which has been witnessed by a large group of press experts.

The net impression of these people seems to indicate that our development may preface sweeping changes in the whole field of metal stamping.

It was our original intention to restrict the application of this press to certain specialized industrial fields, but it is now apparent that it has the broadest possible application and the pressure to release general information regarding its performance has been overwhelming.

We, therefore, use this open letter as an invitation to authorized personnel to see this machine in operation.

If you will express your desire in letter form on company stationery, it will receive our prompt attention.

Very truly yours,

WEAN EQUIPMENT CORPORATION

R. J. Wean, Jr.

R. J. Wean, Jr.
President

Wean

FLYING PRESS

Designed primarily for speed of operation, the Wean Flying Press is the first machine of its kind to successfully combine the fast operating advantages of continuously fed strip with dies which move with the strip.

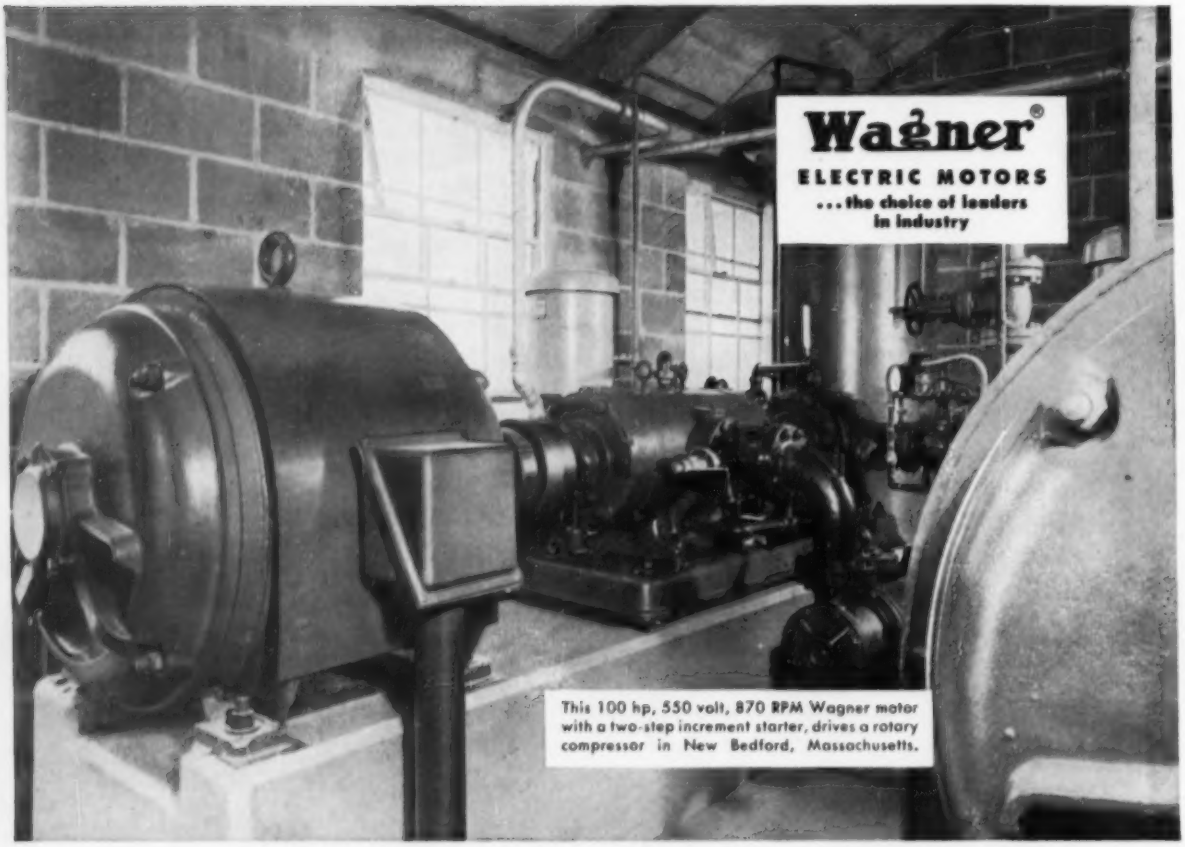
The press differs greatly from conventional machines. Machine tool-like in appearance, it has a minimum of vibration and requires no foundation. In addition to its great speed, it incorporates several new design principles that should interest every press user.

An automatic adjustment of feed length while press is in motion, and the absence of a clutch and brake (the most frequent points of maintenance on conventional presses), are two examples of this advanced engineering.

Wean 60-ton Flying Press stamping out automotive hinge plates at 600 pieces-per-minute, using the same die set which on a conventional press made the parts at a rate of but 90 pieces-per-minute.

Wean EQUIPMENT CORPORATION Cleveland, Ohio

Chicago Newark, N. J. Detroit



This 100 hp, 550 volt, 870 RPM Wagner motor with a two-step increment starter, drives a rotary compressor in New Bedford, Massachusetts.

Start large polyphase motors with minimum line voltage disturbance

USE THE Wagner INCREMENT MOTOR AND STARTER COMBINATION

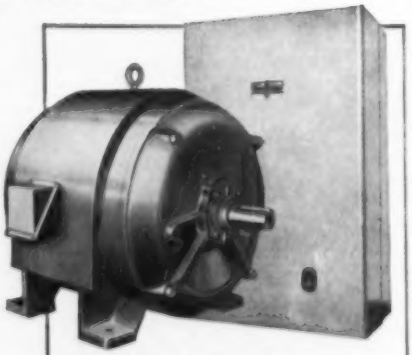
Here's a modern, economical, highly efficient way to start large polyphase motors – the Wagner Increment Motor and Starter "Package."

By reducing current drawn from the line on each point of the starter, the combination limits the inrush of motor current to values that are acceptable for the distribution systems of most power companies.

Voltage disturbances on the line are reduced because current taken from the line is not broken during the starting period–as it is when auto-transformers or compensator type starters are used.

Wagner two-step increment motor and starter combinations are suitable for most applications. For installations where unusually low inrush of starting current is desired, Wagner can furnish three-step and four-step increment starters.

Your nearby Wagner engineer will help you select the increment motor and starter combination that meets *your* requirement. Call the nearest of our 32 branch offices, or write us.



Type RP polyphase motor in ratings to 400 hp with increment type starter

Wagner Electric Corporation
6403 Plymouth Ave., St. Louis 14, Mo., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

M55-16

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS–AIR AND HYDRAULIC

Report to Management

In the Final Quarter
U. S. business is smashing through the final quarter of the year with the strength and drive of a championship football team.

And like a winning team, business draws strength from depth and ability to substitute a new set of factors if one appears to be faltering.

This has prevented seasonal factors from having their usual effect on the economy. Or, for example, when brakes on home building were applied in the form of tighter mortgage terms, a spurt in industrial and commercial building kept the construction industry going at its accelerated pace.

A Strong Lineup
You can't spot a weakness anywhere today. Consumer buying and manufacturers' new orders are now teamed up to create one of the strongest demands for durable goods ever seen.

Personal income continues at a record rate, supplying the means for steadily rising consumer demand. And manufacturers are placing orders for machinery and durable equipment at a rate that is the highest since the Korean War buildup.

Civilian emloyment reached 64.7 million in September, highest figure for that month in history. Unemployment is at its lowest since 1953, backed up by a sharply increased average hourly rate of pay.

These are just a few elementary facts to support what you should know: that the outlook continues good, that it's based on solid factors, not paper profits.

You will see the proof in annual statements when they are prepared at the end of the year. Third quarter reports now indicate that 1955 will be the second best corporate profit year in history. Profits will total about $21.5 billion compared with about $22.5 billion in record 1950.

Water over the Dam
Don't count too much on being able to obtain privately written disaster insurance to cover industrial loss due to floods.

And disaster insurance bills headed for the next session of Congress have little chance of adoption. Proposals include government reinsurance of commercial policies. Cost would be split between the U. S. and insurance company.

There's no indication that insurance companies will welcome the Federal government as an insurance partner. Nor are they likely to market policies covering a disaster situation such as that resulting from last summer's floods. Only about 5 to 10 pct of the property loss sustained in the Northeast was covered by existing insurance.

A New Look at Write-offs
Don't be surprised if there is a re-evaluation of the fast tax write-off policy regarding the steel industry. It won't be based solely on the need for more steel capacity. That's established.

It's the question of whether write-offs would cost the government money in lost tax returns that will get a second look. Some very prominent economists now take the position that write-offs would not hurt the Treasury in the long run.

There's no doubt that a company benefits when it obtains tax concessions. But the second theory is that expenditures for steel expansion would actually yield immediate tax revenues from supplying industries that would equal or surpass those lost from the immediate tax concession.

INDUSTRIAL BRIEFS

Furnace Sales . . . Industrial heating boom continued through September when sales totaled $8,350,712, a full 330 pct over the figure for September of 1954. According to statistics compiled by the Industrial Heating Equipment Assn., sales reached $61,355,470 for the first nine months of 1955.

Research . . . The new $1,500,000 research laboratory of Jones & Laughlin Steel Corp. was dedicated as The Graham Laboratory for J&L Research. The new facility is named for Herbert W. Graham, who was J&L vice president-research, before becoming consultant to the president a year ago.

New Radio . . . A transistor radio that derives its power from the sun, requires no tubes or replaceable batteries, and which could conceivably last a lifetime without repair, has been announced by Admiral Corp.

Plants . . . Norden-Ketay Corp. has established a western div. in Gardena, Calif., and nearby Hawthorne. Plants will conduct research, development, engineering, and sales service.

Brakes . . . An improved emergency braking system which enables the operator of a truck-trailer combination to make at least one controlled stop in case regular brakes fail, has been developed by a joint Truck-Trailer Manufacturers Assn.-Automobile Mfg. Assn. Motor Truck Technical Committee.

Administration . . . Chrysler will transfer administration of Evansville, Ind., body plant from the Automotive Body Div. to the Plymouth Div. Change will be completed by Dec. 31.

Far East Branch . . . Ferro Corp., Cleveland, has established a district sales office in Hong Kong.

Acquisition . . . U. S. Industry, Inc., acquires Southern Pipe and Casing Co. near Azusa, Calif. Acquired company makes welded steel pipe, has sales running about $10 million a year.

Merger . . . Consolidated Vacuum Corp., Pasadena, Calif., has been merged and will be known as ConVac Div. of Consolidated Engineering Corp.

Power Unit . . . An auxiliary power unit developed by The Garrett Corp. AiResearch Manufacturing Div., Los Angeles, provides electrical and mechanical, or hydraulic power, to operate guidance and control systems in guided missiles.

Add Division . . . IBM, New York, has completed formation of a Military Products Div. It will be a self-contained engineering, manufacturing, and administrative unit.

Alloys . . . Sand-cast 220 aluminum-base alloys, reported to have better mechanical properties than commercially available 220 alloy, have been produced by a process described in a report of Army-sponsored research just made available by the Office of Technical Services, U. S. Dept. of Commerce.

New Machine . . . A new machine which solves a major inventory problem in packaging has been announced by Pitney-Bowes, Inc., Stamford, Conn. The device is a carton imprinting machine that automatically feeds, imprints and power-stacks at a rated speed of 10 thousand pieces an hour.

Buy Plants . . . Diebold, Inc., Canton, Ohio, acquires K. F. Cline Co., Inc., Dickson, Tenn. Transaction covers manufacturing facilities with two plants. Diebold makes safes, office systems and related equipment.

Sell Bearings . . . Donley Products, Inc., Cleveland, appoints The Garrett Supply Co., Los Angeles, as distributors of Jergens Live Pilot bearing bushings.

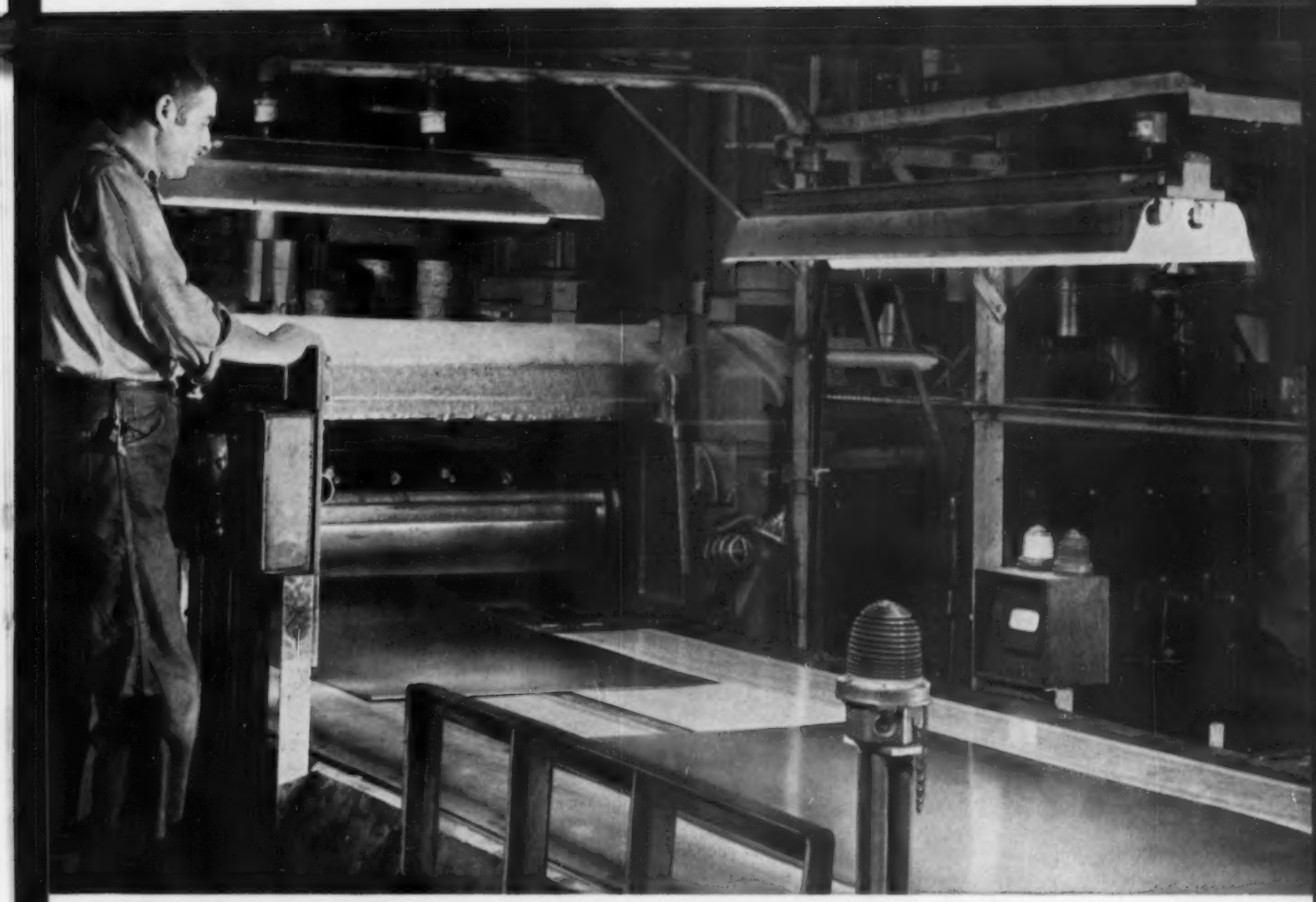
New Plant . . . Chromalloy Corp., New York, will move plant and office functions to White Plains, N. Y. New plant will be occupied on or about Dec. 1, will have over 12,000 sq ft of floor space.

Service Award . . . Frank R. S. Kaplan one of the founders of Copperweld Steel Co., has been awarded a pin for his forty years service with the organization.

Disabled Training . . . Twenty pct of the severely disabled Korean veterans have enrolled for training as compared to only 10 pct of the slightly disabled, according to a Veterans Administration study.

Mexican Affiliate . . . Harbison-Walker Refractories Co. has purchased an interest in Fabrica de Ladrillos Industriales y Refractarios, S.A., of Mexico. The name will be changed to Harbison-Walker-Flir, S.A.

Ancient Metallurgy . . . A study of metal fragments by Dr. Earle R. Caley and Wallace H. Deebel, both of the Ohio State University, from a cave in Afghanistan, indicates ancient metallurgists had reached an advanced stage in their development. A broken piece of pin or shaft dating from the seventh or eighth century was proved to be tempered steel.



How Great Lakes Steel *X-rays* quality

Above: Stacking sheets after the X-ray check. *Below:* With dozens of tests passed and uniformity assured, the flat-rolled steel is O.K.'d for wrapping and delivery.

Why do sheets from Great Lakes Steel consistently meet customers' specifications? The X-ray machine is one of the answers. Here an indicator (shown above) signals the thickness of steel sheets as they pass on a conveyor belt. Any sheet failing to meet the established standard is immediately ejected.

Throughout the Great Lakes mills, modern machines and experienced men work together to maintain the consistent quality of our flat-rolled products. Our service includes close contact with customers by Great Lakes representatives, men who are concerned not only with steel production but also with the performance of our steel in the plants of customers.

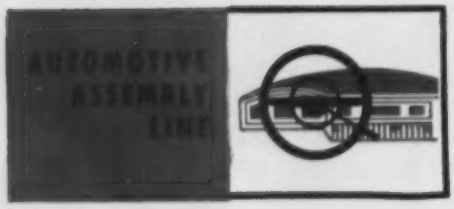
The next time you have a problem in steel, give us a call. You will find that both quality and service are *consistent* at Great Lakes Steel.

GREAT LAKES STEEL CORPORATION

Ecorse, Detroit 29, Michigan • A Unit of

NATIONAL STEEL CORPORATION

District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.



GM Takes Pro-dealer Laws to Court

Colorado statute to be tested in courts . . . GM attacks law that prohibits canceling dealer contracts . . . Could affect entire industry system of merchandising . . . NADA pushes law—*By T. L. Carry.*

◆ THERE'S a legal test coming up soon in the Colorado courts involving automobile dealers and manufacturers and the outcome is likely to have a widespread effect on the whole structure of automobile merchandising.

The case specifically involves General Motors Corp. which is attacking the constitutionality of amendments which the Colorado Legislature has attached to the state's dealers' license law.

Can't Cancel . . . The amendments provide that auto manufacturers cannot cancel contracts with dealers after they expire unless just provocation can be proved in the courts. Among other things, the changes also prohibit automakers from assessing dealers for part of the costs of advertising and dealers cannot be forced to buy cars which they have not ordered when they have more accessories than would ordinarily be included in the list price.

The increasingly strong hand of the National Automobile Dealers Assn. can be seen in the fact that the law and the amendments were passed in the first place. At least two other states, Wisconsin and Virginia, have similar laws.

Easy Selling Over . . . The purpose of the laws is to protect dealers from what they call unscrupulous practices on the part of manufacturers. NADA claims that dealers have large investments in their business and, because of the unilateral contracts which manufacturers have, franchises can be cancelled without notice.

The opinion in the auto industry is that immediately after the war, when buyers virtually had to get on their knees to buy a car, dealers got the impression that selling automobiles was as simple as walking around the block.

But times have changed. Each year, competition gets tougher and those dealers who do not realize that selling cars is a hard job today are going to go out of business.

Industry Involved . . . General Motors is directly involved in the case in Colorado but the result is going to reflect on the whole industry. GM claims that the law has the effect of regulating private business and thus should be discarded.

If GM loses its case, there will be a rash of laws throughout the country which no doubt will protect dealers but will change the entire system for selling new cars.

Suggest New System . . . One possible effect of such laws could be a limitation on the number of cars a dealer would sell and ultimately a limitation on the number of cars which would be produced.

Perhaps neither side in the

Ford Pay Stock as Dividend?

◆ FORD Motor Co. stock will be offered to the public in a plan under which Ford family members will relinquish up to 60 pct of voting rights in the giant auto company headed by Henry Ford II.

More groundwork for the sale was done last week when Ernest R. Breech, Ford board chairman, revealed that the company's earnings this year will surpass the total earnings for the entire 21 years prior to World War II.

Profits, according to Mr. Breech, for the first 9 months of 1955 are greater than the total for any year in Ford's history.

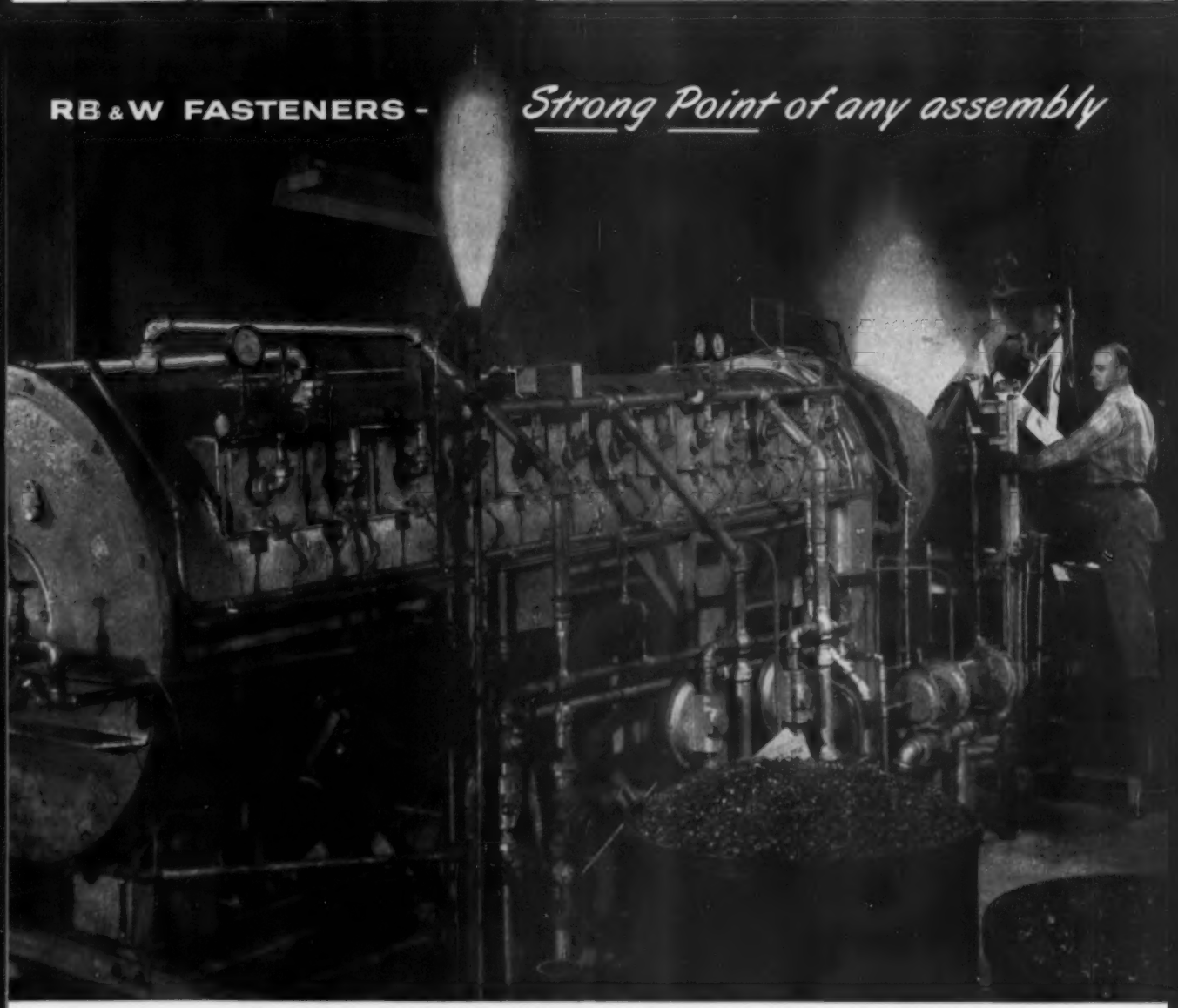
Ford, which previously has been vigorously opposed to revealing anything about its earnings, has been deftly setting the stage during the last year for the sale.

Mr. Breech's remarks in St. Louis are the closest Ford has ever come to revealing how much it makes. Main purpose of the speech apparently was to whet the public's appetite for more news concerning Ford's financial position and at the same time make sure that when the stock is offered it will bring a very high price.

Because the Ford Motor Co. is entirely family owned, it is not required to publish a financial statement. It will have to do so, of course, before stock is offered for public sale.

The company will be recapitalized, three new classes of stock will be issued. After splits, the company will have a total of 53,461,470 shares of stock. There is no question but that the stock will be snapped up by investors when it is placed on the market. First estimates placed possible market value at about $60.

RB&W FASTENERS - *Strong Point of any assembly*



Gas chamber for fasteners that lengthens their life

CARBURIZING of fasteners is being done here . . . *GAS* carburizing. This method stands head and shoulders above the bath type treatment. It gives greater control of surface hardness, of quality.

Above, Gene Luzzi, has just loaded a hopperful of *Spin-Lock* screws into the chamber. Heated and then quenched under his experienced eye (11 years with RB&W), the screws emerge with deeper, more uniform case hardness, and controlled core strength. RB&W hinge pins, tapping screws and other fasteners get their longer life in this department.

If there's a better method or some extra special equipment that can help turn out the best fasteners possible, you're sure to find it in RB&W plants. With the most modern and complete facilities available, RB&W's skilled operators — many of whom are second generation RB&W men — can put their experience to best advantage.

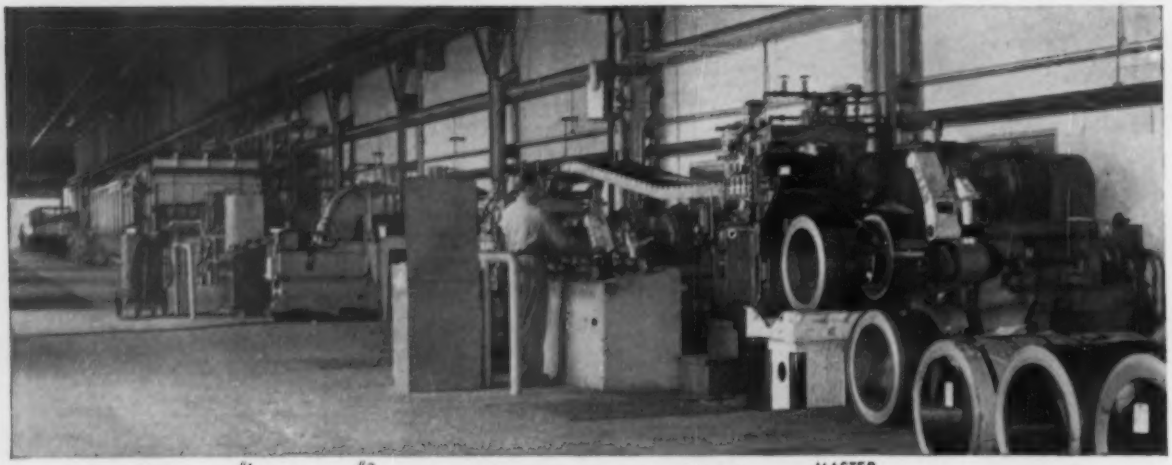
This combination of facilities, experience and quality control can't miss. It assures you more quality for your money . . . a reliable source of supply . . . and strong fasteners that never let you down.

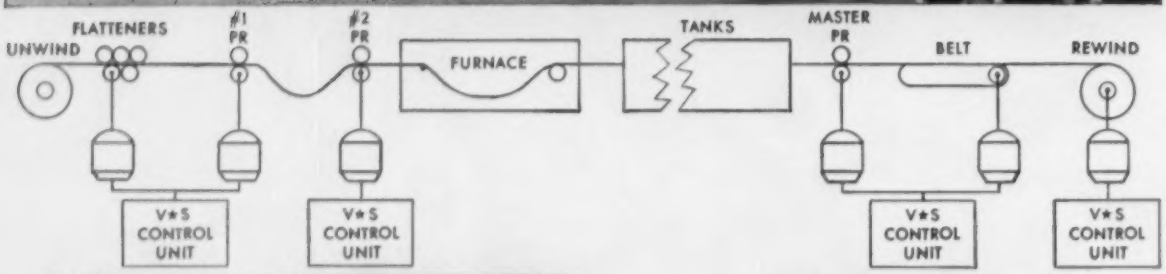
Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

R B & W

110th year

Plants at: Port Chester, N. Y., Coraopolis, Pa.; Rock Falls, Ill., Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Seattle. **Distributors** from coast to coast.





Pickling Line V★S Drive Control Units

RELIANCE V★S DRIVE ®

PACKAGED DRIVES KEEP STAINLESS ON THE MOVE

As much as 14 miles of stainless steel strip is processed each day on the Atlas Steels, Ltd. two-strand pickling line . . . Canada's first continuous stainless steel pickling line.

Because this is a large stainless line requiring special care to prevent surface marring or scratching, consideration had to be given to the drive system. The drive requirements were for precisely controlled tension over wide speed ranges with extremely reliable control. Reliance V★S Drives with built-in electronic regulators keep the line moving and afford the flexibility to permit line speeds from 5 to 50 feet per minute for strip .007 to .187 inches thick and 10 to 20 inches wide.

Four compact V★S Control Units which house the factory-wired motor-generator sets and the control panels supply power to the motors for each half of the twin line. The "packaged" feature of the drive means extreme ease of installation and a great saving in installation cost plus the ability to tailor the drive system to the actual requirements. This "tailoring" meant that wide constant-horsepower speed range motors could be used to fit in with the line speed variables. These variables were created by the need for running strip of varying thicknesses and widths through the line at speeds dictated by the annealing furnace "constant tons per hour" limits.

This is a good example of the ability of Reliance to tailor drive systems to the specific application requirements of the steel industry. Write for Bulletin A-1555. D-1555

RELIANCE ELECTRIC AND ENGINEERING CO.

Cleveland 10, Ohio • Offices in Principal Cities

Canadian Division: Welland, Ontario

Builders of the Tools of Automation

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Nov. 5, 1955	180,172	26,886
Oct. 29, 1955	163,532	24,751
Nov. 6, 1954	96,101	20,474
Oct. 30, 1954	71,366	19,296

*Estimated Source: *Ward's Reports*

argument is 100 pct right about the law. One observer who is close to the dealer situation in Michigan suggests that legislating merchandise is not the correct approach to the problem. He believes that contracts between dealers and manufacturers should be arrived at through a fair bargaining system just as the UAW bargains with the industry.

Tooling Up:

Orders for 1956 mean a big change in '57.

Just about everybody who has made a prediction about the business outlook for 1956 has said that the economy will continue to be just as good or better. No forecaster has gone beyond that point specifically but an inkling of what is to come in 1957 popped up last week at the National Tool and Die Manufacturers Assn. convention.

Contract tool and die makers in the Detroit area are predicting that 1956 will be a banner year for them. This is what it boils down to. Tool and die companies in Detroit do the major part of advance tooling for the automobile companies. The record-breaking amount of work they will be doing next year will be for the 1957 cars.

One observer predicts that contracts from the automakers will total close to $150 million. The reason for the big expenditure is that auto producers are going to make a major change in 1957 and thus will require more extensive retooling. This will affect the rest of the economy and particularly tool and die companies that are not in Detroit.

First, tool and die makers say that there are not enough job shops in the area to take care of the whole auto program for 1957. As a result, other shops in neighboring states are likely to come in for a good share of the auto business.

Secondly, with most of the shops in Detroit tied up with automobile contracts, other industries which require tool and die production will have to farm their work out to other areas.

It is becoming more obvious every day that automakers in Detroit are not counting on any letup in the present economic boom at least for the next two years and probably well beyond that point.

Need Apprentices

One of the biggest problems which confronts tool and die makers is the carrying out of a proper apprenticeship program. Tool and die companies are finding it increasingly difficult to get young men willing to take a four-year apprenticeship course.

Most young people who have an aptitude for tool or die making are enrolling in engineering schools at universities around the country.

There is no definite solution to the problem but the association has undertaken a program of education which is designed to make the apprentice's lot a happier one and to draw more recruits.

Biggest aid in recruiting apprentices is the automatic deferment from the draft of any youngster who is taking an apprentice course.

Nash Changes

One more new car, the 1956 Nash, made its debut this week. Styling changes on the Ambassador series include a color spear on the side which is outlined in chrome trim. A single chrome trim line is used on the Nash Statesman. Both cars have redesigned rear fenders and taillights. The V-8 engine on the Nash can develop as much as 220 hp and a new 6 cylinder engine will produce either 135 or 145 hp. The Statesman has a wheelbase of 114¼ in. and the wheelbase on the Ambassador is 121¼ in.

THE BULL OF THE WOODS — By J. R. Williams

YOUR HITCH SLIPPED AN'-- AN'--
TH' GUY'S GOT QUITE A PAUNCH ON HIM, BUT HE'S ONE OF THEM JOKERS! I THINK HE'S HOLDIN' IT IN SO RUDY TH' HITCHER WILL THINK IT'S STRETCHED TO TH' FLOOR!
TO HOLD THAT BIG A BAY WINDOW IN MORE THAN A SECOND IS TORTURE--HE AIN'T HAVIN' MUCH FUN!
J.R.WILLIAMS
THE WIT
Copr. 1955 by NEA Service, Inc. T. M. Reg. U. S. Pat. Off. 11-9

Sheffield Tube Corporation reports: *Kemp Melting Pot melts 2,200 lbs. of lead per hour, eliminates down-time*

The Sheffield Tube Corporation, New London, Conn., manufactures tubes for toothpaste, cosmetics, drug specialties and similar products. Slugs for extruding are punched from thin lead sheets, which are rolled from moulded slabs. To melt large "pigs" for moulding these slabs, Sheffield formerly used three pots: two meltdown pots, feeding into a 1,276 lb. capacity holding pot. This equipment has been replaced by one Kemp Immersion Melting Pot, capable of melting 2,200 lbs. of lead per hour.

Kemp boosts production . . . cuts down-time

Formerly, one man produced about 500 slabs daily; dross formation had to be removed two or three times daily; and the pots were replaced after anywhere from 6 weeks to 6 months of operation. With the Kemp Melting Pot, two men now mould about 1,400 slabs daily. During the first 5 weeks of service dross was not removed once—and except for an occasional 10-minute valve-cleaning job there was no down-time at all.

Kemp can help you

Whatever your application, it will pay you to investigate Kemp Melting Pots. You'll benefit in many ways: Kemp units are not subject to periodic and expensive breakdowns . . . offer greater heating surface, faster heat recovery, lower dross formation, lower room temperatures. Whatever your problem, Kemp units will help cut labor costs, eliminate lost time, increase output.

Find out how Kemp engineers can provide the most profitable solution to your heating or melting problems. Write for Bulletin IE-10 today.

KEMP OF BALTIMORE

IMMERSION MELTING POTS

CARBURETORS • BURNERS • FIRECHECKS • ATMOSPHERE & INERT GAS GENERATORS • ADSORPTIVE DRYERS SINGEING EQUIPMENT

THE C. M. KEMP MFG. CO.
405 East Oliver Street, Baltimore 2, Maryland

THIS WEEK IN WASHINGTON

Are Broad Tariff Cuts Coming?

State Dept. wants to lower most import duties 5 pct . . . Move draws loud protests from manufacturers . . . Fact-finding sessions will continue past November . . . See cuts likely—By G. H. Baker.

◆ GOVERNMENT'S tariff experts are being snowed under by an avalanche of argument against lowering the trade barriers, but they may go ahead and trim the current rates anyhow.

State Department wants to cut nearly all existing import duties by 5 pct a year for the next three years, for a total 15 pct.

Public hearings before the U. S. Tariff Commission (a fact-finding body only; it can't change rates) are going on now. They feature a long procession of manufacturers and trade association men who predict ruination of their industries if rates go any lower.

Delay Decision . . . Decision won't be made for many weeks. Hearings before the Tariff Commission and the State Department Committee on Reciprocity Information will occupy most of November. Then the Commission will huddle for several more weeks to examine the evidence and write recommendations.

Generally, the Tariff Commission is sympathetic to pleas for prohibiting further rate cuts, but free-traders in the State Dept. have the upper hand at the White House and probably will win.

Standardize Steel . . . High cost of road construction is to ease off somewhat, as a result of federal-state accord over standardization of some steel products.

Federal officials who have been working out the standardization program say steel mills will now be able to level out their peaks and valleys of production for a number of the steel products that go into highway construction.

Because nearly every state highway commission has its pet specifications for key products, the mills are required to maintain dies for a large volume of high-cost, short run production.

Make 60 Types . . . Welded wire fabric, for example, is being produced in nearly 60 different types and sizes because of the lack of coordination among states. This list could safely and economically be trimmed to about half a dozen types.

Recently, highway officials from seven states reached final agreement with Washington on 68-lb welded wire fabric (68 lb per 100 sq ft), and on 6 by 12 in. spacing. (Other states want 4 x 6 spacing, some 6 x 6.)

Another steel product ripe for standardization is beam type guard rail. Tensile strength requirements are nearly uniform now, but specifications as to size and shape vary widely.

See Flying Bases . . . Because atomic airplanes will be able to stay aloft for long periods (as long as several months, some nuclear scientists say), it's going to be feasible for the U. S. to withdraw from most of our air bases located overseas.

Rapid progress made recently in perfecting atomic-power aircraft indicates that atomic flight is at hand. The Air Force is speaking openly of plans for a fleet of "atomic tankers," which will be used to refuel conventional jets in flight. Looking still farther ahead, the time is not too far off when all aircraft—large and small—may be atomic powered.

Eye Canadian Cut . . . Defense officials here are watching with interest Canada's newly-announced plans for reducing defense spending. Since defense costs are up in Canada as well as in the U. S., the Pentagon points out that a smaller defense budget, if approved by Ottawa, can only mean that some military projects

Beg, Borrow and Spend

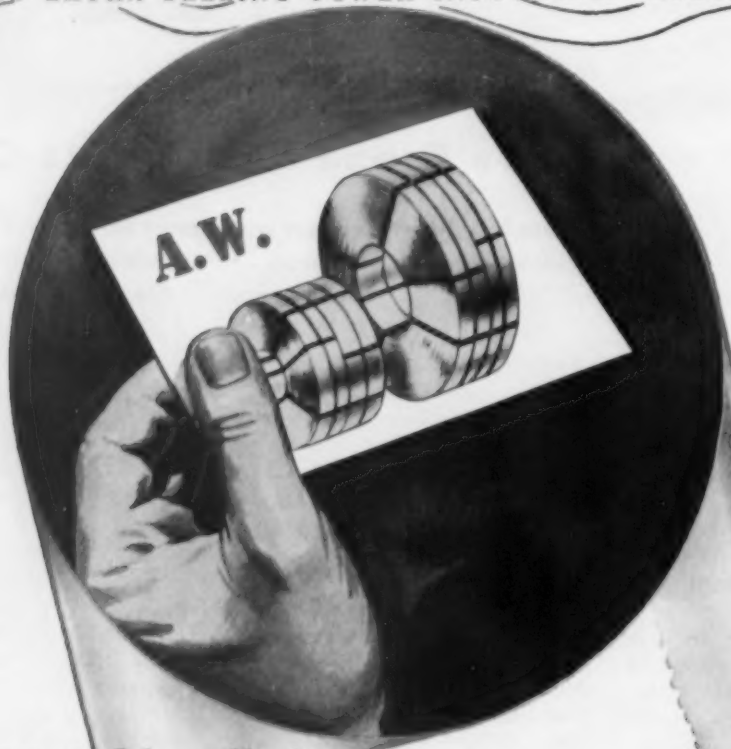
▪ In the second quarter of this year, consumers added $500 million more to their debts than they did to their financial assets.

▪ In the April-June period, home construction and alterations amounted to $4.3 billion, and purchases of automobiles and other durable goods totaled $9.1 billion.

▪ Total amount of savings actually decreased by $500 million, although the big jump in purchases—considered additions to financial assets—brought total savings to $12.9 billion during the quarter.

Figure is up $400 million from the first three months of the year, but down from the $16.5 billion recorded in the final quarter of 1954.

BUILDS EXTRA SELLING POWER INTO YOUR PRODUCTS



...hot or cold rolled...
A. W. STRIP STEEL is a salesman
...for your products

Invisible . . . yes—but there, nevertheless . . . adding the superior qualities of strip steel produced precisely to your specifications of temper, finish and uniformity under the most rigid metallurgical control—qualities that help give your product the strength and dependability which build reputation and sales.

If your products require hot or cold rolled strip or sheets . . . call upon the services of an integrated steelmaster with modern, up-to-date continuous mills—where "custom-production" is standard practice. Call upon ALAN WOOD STEEL COMPANY.

IRON PRODUCTS
"Swede" *pig iron*
STEEL PRODUCTS
Plates (sheared)
Hot rolled sheets
Hot rolled strip
Cold rolled sheets
Cold rolled strip
ROLLED STEEL FLOOR PLATE
A.W. ALGRIP *abrasive*
A.W. SUPER-DIAMOND *pattern*
A.W. CUT NAILS
MINE PRODUCTS
COKE
COAL CHEMICALS

ALAN WOOD STEEL COMPANY

steelmasters for 129 years • CONSHOHOCKEN, PENNA.

DISTRICT OFFICES AND REPRESENTATIVES: Philadelphia • New York • Houston Los Angeles • Atlanta • Boston • Buffalo • Cincinnati • Cleveland • Detroit • Pittsburgh Richmond • St. Paul • San Francisco • Seattle • Montreal and Toronto— A. C. Leslie & Co., Limited

5M-13

are being abandoned.

Defense Minister Ralph Campney says he plans to at least hold, if not reduce, military spending. "We must try to keep a limit on this kind of expenditure," he declares. Reductions are justified by the "easing of tension" in Europe.

Test Turbine . . . Sea trials of the new marine gas turbine being developed by General Electric for the federal government will take place next spring, the U. S. Maritime Administration says.

Development of the new turbines will mean that ship owners will have available an efficient new power package and the government will have for full mobilization purposes a propulsion unit which can be built, operated, maintained, and controlled with minimum manpower.

Plan Atom Train . . . World's first atom-powered locomotive is being scheduled in the Senate to pull a "freedom train" of public displays which will demonstrate industrial uses of atomic energy.

Sen. John Marshall Butler, R., Md., is backing this proposal. He wants every citizen to have a first-hand view of progress being made by U. S. industry in harnessing the atom for peaceful uses. An atomic exihibt train, he points out, would stimulate new applications of atomic methods, and would interest new capital in new atomic power applications.

Contact Companies . . . U. S. Atomic Energy Commission is working with Baldwin-Lima-Hamilton and the Denver & Rio Grande Railroad on the engineering aspects of an atom-powered locomotive. A report, plus recommendations, is due from this combine next March. Edward J. Kehoe, formerly associated with the AEC and now a transport consultant, says an atomic locomotive is entirely feasible.

The Navy, meanwhile, is being urged by Senator Henry M. Jackson, D., Wash., to speed up development of atom-powered aircraft carriers now that A-power subs have proven practical.

Disaster:

Congress will get flood insurance measures.

Specific legislative proposals providing for insurance against flood and other disaster damage are to be offered to Congress early in 1956 by the Eisenhower Administration.

Tentative program would protect industry and individuals against ruinous property losses.

Set Limits

Included in the present tentative plan are:

1. An initial limitation of perhaps three years on the government program.

2. A specific ceiling on the amount of insurance written during this experimental period.

3. Broad government authority to fix rates. There is no acceptable formula for this action, because actuarial data are lacking.

4. A limit of $250,000 to $300,000 on the amount of coverage available to any one firm or individual.

5. A requirement that owners carry part of the premium cost of the insurance on their business inventories, real property, and farm crops, growing and harvested. No coverage for personal property would be offered.

While various plans for a disaster insurance program have been taking shape, a Senate Banking subcommittee headed by Sen. Lehman, D., N. Y., has begun holding public hearings on the problem in Eastern cities. The subcommittee chairman has proposed a $12-billion insurance program to cover losses from man-made and natural disasters.

Sen. Payne, R., Me., also will present a flood insurance bill, with Sen. Saltonstall, R., Mass., and Sen. Kennedy, D., Mass., as co-sponsors. This measure will recommend cooperation between the government and insurance firms in setting up an experimental program.

"Never say, going down!"

Aircraft Labor Short

Out of 194 major aircraft and aircraft parts plants which employ 95 pct of the industry's workers, almost half of them are having difficulty hiring specialized workers. When surveyed in January, one-third of them reported difficulties.

In August alone, aircraft firms were asking the public employment service to find 3689 scarce workers, mostly engineers and highly-skilled production workers to be recruited from other areas.

While lack of workers "almost never impedes production," Labor Dept. says, it requires use of overtime work and intensive recruiting. In one case, a firm loaned some of its skilled workers to help another firm tool up.

See Bichromate Gains

National output of sodium bichromate and chromate is to total 109,000 short tons this year, topping 1954 production figures by 9 pct.

Even with this anticipated advance, output is to be 15 pct less than the record level reached in 1951, reports the Business and Defense Services Administration. Its prediction is based on results of a recent survey by the Chemical and Rubber Div., BDSA.

Metal treating and plating requirements account for the second largest sodium bichromate and chromate use.

NEW MONORAIL CRANE

offers many advantages

For up and over handling this new American MonoRail Crane offers you the following advantages:

- up to 10 ton capacity
- meets low headroom conditions
- extra store room
- carrier service beyond craneway
- fingertip control from floor
- all movement power operated
- low maintenance cost

These are but a few reasons why you should call an experienced MonoRail engineer to help you with your handling problems.

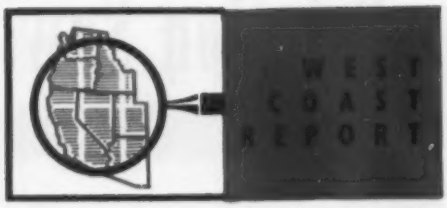
AMERICAN OVERHEAD HANDLING EQUIPMENT

MONORAIL COMPANY

13103 ATHENS AVENUE • CLEVELAND 7, OHIO

"Up-and-Over" is the title of our 16-mm sound film showing how MonoRail solves many tough handling problems at low cost. Please allow us three weeks to schedule a showing for you.

Member of Materials Handling Institute - MonoRail Association



Here Are West Coast's New Markets

Latest report on new metalworking facilities . . . Diversified plants are involved in westward trek . . . Fisher Body, major divisions as well as young companies create new business—By *R. R. Kay.*

◆ ARE YOU GETTING your share of metalworking's big West Coast boom?

If not, here's an up-to-the-minute report of new and expanding metalworking plants — and what they make. They're all good and immediate prospects for equipment, materials, and services.

Here They Are . . . On-their-toes sales managers will hustle their salesmen out to these plants:

Aluminum garage doors — Columbia Aluminum Products Co., Portland, Ore. . . Agricultural implements—Nu Way Harvester Co., San Jose, Calif. . . Hydraulic metal spinning — Hydro Metal Spinning Co., Los Angeles.

Transformers — B. C. Transformer Co., Ltd., Burnaby, B. C. . . Screws—Phoenix Screw Products, Phoenix, Ariz. . . Industrial coating compounds—Products Research Co., Burbank, Calif. . . Aircraft tools, jigs, fixtures—Basic Tool Industries, Inc., Gardena, Calif.

Batteries—Nic-L-Silver Battery Manufacturing Co., Phoenix, Ariz. . . Tank heads and fabricated welded products—Research Welding & Engineering Co., Inc., South Gate, Calif. . . Door hinges—Henry Soss and Co., Los Angeles.

Lithium and rare earth metals mining—Uranium Enterprises of America, Inc., Phoenix, Ariz. . . Mechanical coil springs — California Spring Co., Inc., Los Angeles. . . Sheet metal work—Bay Cities Tin Shop, Venice, Calif.

Tractor parts—Oregon Pacific Mfg. Co., Portland, Ore. . . Guided missiles research and development—Admiral Corp., Palo Alto, Calif. . . Portable power drills—Powermite Drill & Tool Co., Los Angeles.

Automobile body assembly—Fisher Body Div. of General Motors, Van Nuys, Calif. . . Military jet interceptors — Douglas Aircraft Co., Inc., Torrance, Calif. . . Gas tanks for trucks and trailers —Peerless Trailer & Truck Service, Inc., Portland, Ore.

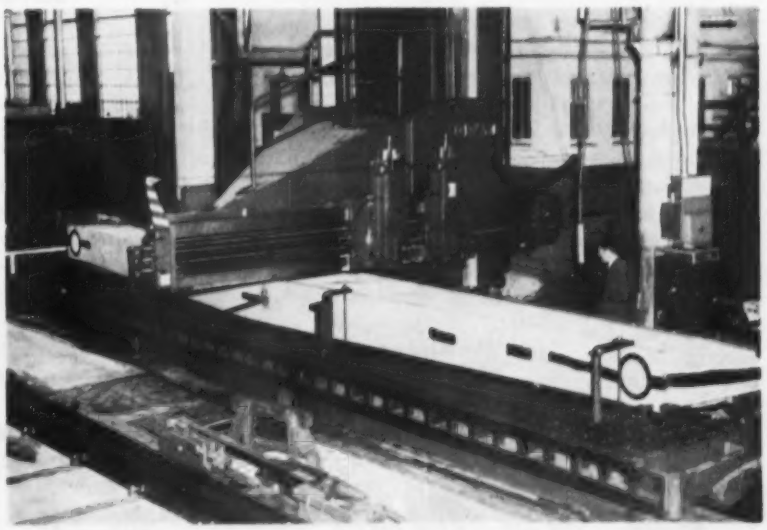
Electric fans and blowers—The Lau Blower Co., Azusa, Calif. . . Home trailers—Jenmac Corp. and B. H. Sheldon Co., both Gardena, Calif. . . Welded fabrication—Aircraft Welding Co., Burbank, Calif. . . Aircraft parts—Weber Aircraft Corp., Burbank.

Steel doors—Grand Metal Products Corp., Portland, Ore. . . Spray painting equipment — Unimasco, Inc., Gardena, Calif. . . Transformers, reactors and chokes—Crittenden Transformer Works.

Highway traffic control and lighting equipment — Econolite Corp., Los Angeles. . . Hydraulic equipment — Ronson Hydraulic Units Corp., Pasadena, Calif. . . Crane carriers—The Maxi Corp., Puente, Calif.

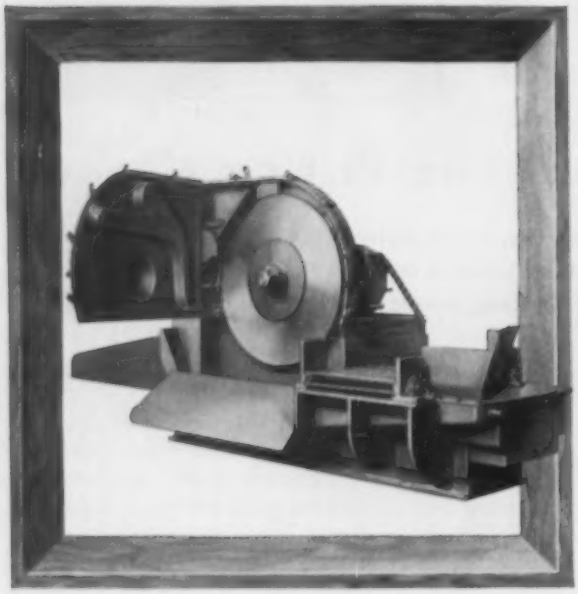
Electronics equipment and components — Pacific Div. of United Transformer Co.; Fenske, Federick & Miller, Inc., Los Angeles; L. M. Engineering Co., Hawthorne, Calif.; Televideo Corporation of America, Los Angeles; Retron Corp., Pasadena, Calif.

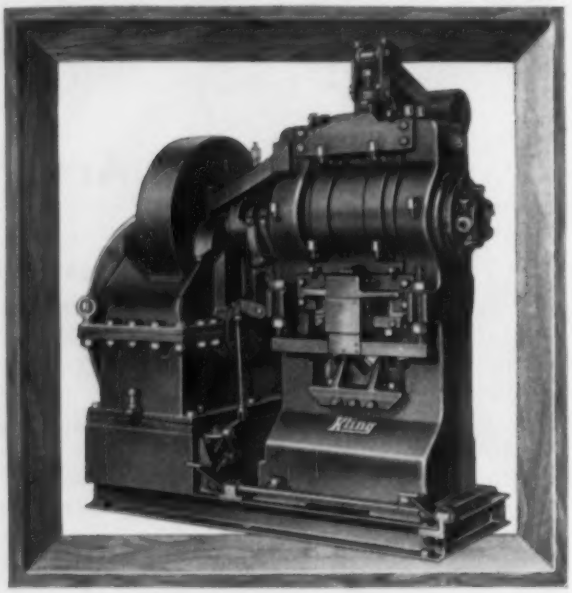
Sprinkler systems and pipe products — Sprinkler Fabrication & Supply Corp., Oakland, Calif.



PLANER planes a planer in a machine shop in Bethlehem Pacific's San Francisco shipyard. Operating unit is one of the largest openside planers ever built. Being worked is clamping beam, part of a plate planer.

Friction Sawing Guillotine Shearing





KLING FRICTION SAWS . . . 10 SIZES (Size 4200 illustrated)
Capacity of this Saw: All standard structural steel sections; all standard steel rails; most steel pipe sections, and many solid sections.

KLING GUILLOTINE SHEARS . . . 5 SIZES (No. 4 Illustrated)			
Tonnage Ratings		#3 Guillotine	175 Tons
#1 Guillotine	85 Tons	#4 Guillotine	250 Tons
#2 Guillotine	125 Tons	#6 Guillotine	650 Tons

Both Attain New Popularity Due to Recent Kling Improvements!

KLING FRICTION SAWS: There are two big reasons for today's renewed popularity of these high-speed saws. *First*—a growing recognition of the exclusive advantage of friction sawing . . . faster cutting of steel shapes (structurals and solids) without changing setup. *Second*—new KLING developments providing semi-automatic control for controlling the speed of the carriage, and other added advantages in line with today's automation trend. KLING Friction Saws also reduce the "cost per cut" to a new low, and one KLING Saw will take the place of several saws of other types, as users in "the best of companies" will verify. Ask for list of users in your industry; also, send for Bulletins 4200 and 9200 giving full details.

Both Are Winning More and More "Production Oscars"

KLING GUILLOTINE SHEARS have been completely redesigned to assure users an even wider range of capacities and still sturdier construction for additional years of service. Some of the new features of the machine illustrated are . . .

Power Drive and Speed Reduction unit is a fully enclosed, welded steel housing containing precision cut, heat-treated steel gears.

The Shear Unit has a ductile iron frame of exceptionally high tensile strength. Other features are shock resistant, alloy tool steel blades, new type guarding, replaceable hardened steel wear strips, heat-treated alloy steel dual pintle blocks, T-slots in steel slide, modern lubrication system.

For data on all the various Kling Metal Fabricating Machines, write today for your copy of the New Complete Line Bulletin 100.

Since 1892

Kling

KLING BROS. ENGINEERING WORKS

1320 N. KOSTNER AVE. • CHICAGO 51, ILL.

Export Distributor: Simmons Machine Tool Corp., 50 E. 42nd St., New York 17, N. Y.

Rotary Shears

Double Angle Shears

Punches

Combination Shear, Punch & Coper

Angle Bending Rolls

Plate Bending Rolls

1083

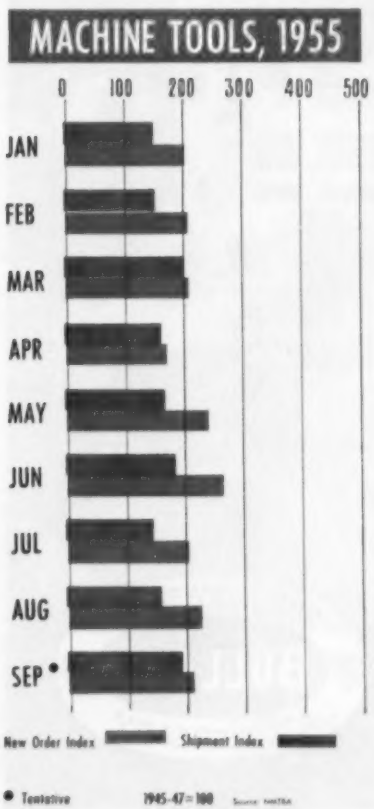
MACHINE TOOL HIGH SPOTS

What Gears Do Machine Tools Need?

Gearing group studies machine tool requirements . . . Idea is to set workable standards . . . Existing formulae leave gaps, make compliance tough . . . Gear index up 13.3 pct—By *E. J. Egan, Jr.*

◆ AMERICAN Gear Manufacturers' Assn. drew a new bead on an old problem at its recent fall meeting in Chicago—the lack of adequate standard specifications for machine tool gears.

A task committee headed by J. M. Claflin of Warner & Swasey is now set up to (1) draw plans to evaluate machine tool gearing requirements; (2) check these against AGMA standards to see where gaps in the standards fail to cover builders' needs; (3) establish groundwork for gear formulae or conversion factors that will allow compliance with builders' requirements.



Machine tool men attending the first session of the new task force committee agreed that Chairman Claflin's crew is tackling a much-needed job.

Builder Speaks . . . Said one builder's representative, "We build 30,000 hours of life into our gears. But the standards we use have to be arbitrary. If we built gears to most existing formulae, one machine tool would fill a whole shop and nobody could afford to buy the thing."

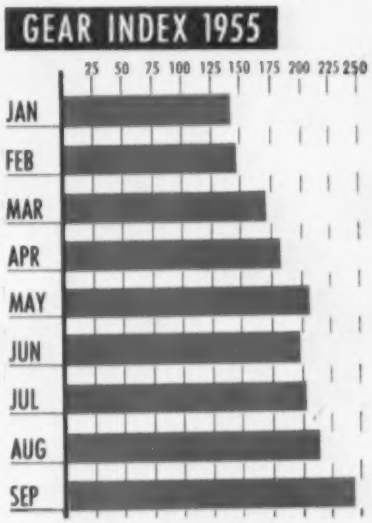
AGMA has already advocated adoption of the 20° pressure angle for gears produced by member firms, as opposed to the one popular 14.5° pressure angle.

Difficulty in this area was pointed out by a machine tool maker who said, "We're presently required to build some tools to old government specs that still call for the old 14.5° pressure angle."

What They Use . . . As for the materials used to make gears, another builder said, "We're making them out of everything, including aluminum." It is true that some individual builders have standardized and minimized the range of materials used for gears.

For example, one firm has cut the number of steel grades used in its gears to just two analyses. But the variety of materials still required for many gears will not ease the committee's job.

The new task force will cover machine tool gearing thoroughly: power transmissions, feed and auxiliary drives, controls and servo-mechanisms. There is general agreement that the group is off to a good start on a worthwhile project.



Base: 1947-49 = 100
Source: American Gear Manufacturers Assn.

Meanwhile the gearing industry reports brisk production. A 13.3 pct increase in activity occurred in September compared with August, 1955, according to the latest American Gear Manufacturers' Assn. monthly index report.

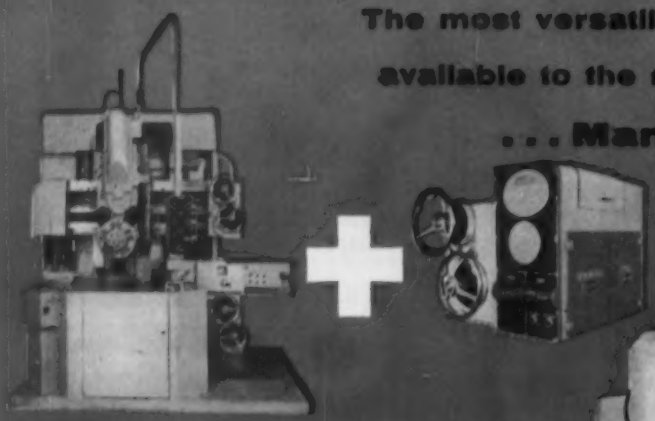
Cut Oil Tax . . . Cost of cutting oils to machine tool users might drop a bit as a direct result of a tax reduction on these products.

A new law cuts the tax from 6¢ to 3¢ per gal on cutting oils sold in liquid form; also chops the tab from ¾¢ to ⅜¢ per lb on cutting oil base sold in bulk.

Machine Tools for Today and Tomorrow!

The most versatile vertical turret lathe available to the metalworking industry...

... Man-Au-Trol, Model 75

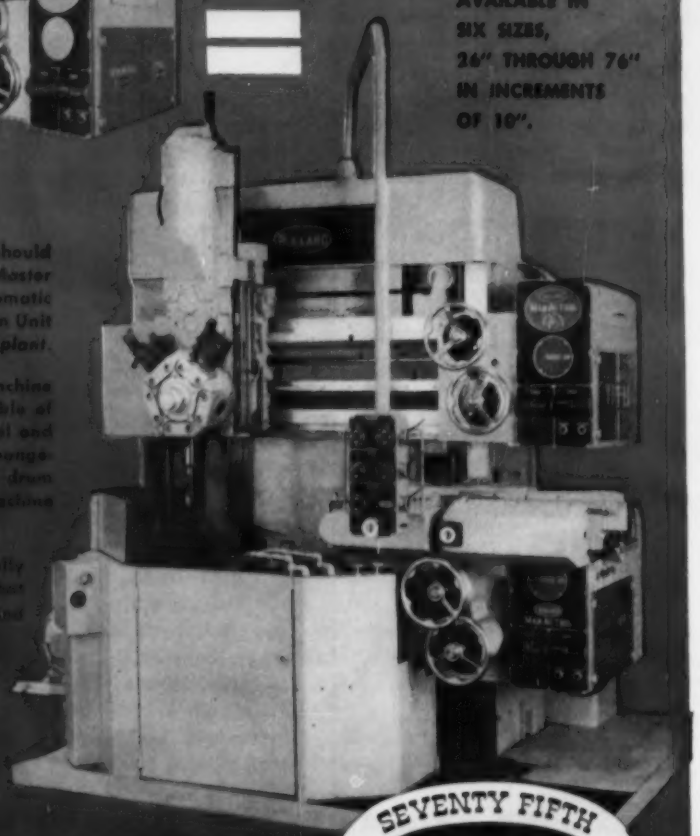


AVAILABLE IN SIX SIZES, 24" THROUGH 76" IN INCREMENTS OF 10".

Versatile because at the time of purchase should your production output require only a Cut Master V.T.L., Model 75 and later increase so that automatic operation is desirable, a Man-Au-Trol Conversion Unit can be added to the Cut Master right in your plant.

The Man-Au-Trol Conversion Unit directs the machine through all the functions the machine is capable of performing — automatically — by use of control and function drums. Machine down time for job change-over is reduced to a minimum since the control drum can be preset in advance and placed in the machine in a matter of seconds.

Your Bullard Sales Engineer will be glad to fully explain all of the technological advantages that are incorporated in the Man-Au-Trol, Model 75 and apply them to your machining problems.



SEVENTY FIFTH 1886 BULLARD 1961 ANNIVERSARY

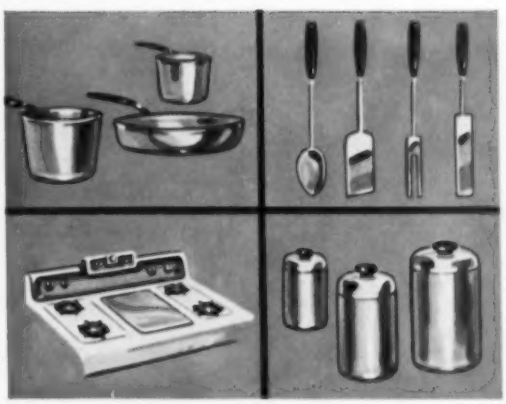
WE INVITE YOUR INQUIRIES — CALL OR WRITE
YOUR NEAREST BULLARD SALES OFFICE, DISTRIBUTOR

THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

modern design specifies stainless steel

McLouth
STAINLESS
Steel
for the home



The lady agrees with the architect that her modern, cheerful, Stainless Steel kitchen will be the most beautiful room in the new house. Stainless Steel is the bright, long lasting metal that will not tarnish, is easy to clean and a joy to live with.

For the product you make today and the product you plan for tomorrow specify McLouth high quality sheet and strip Stainless Steel.

McLOUTH STEEL CORPORATION
Detroit, Michigan

MANUFACTURERS OF STAINLESS AND CARBON STEELS

It's No Gamble with National Metal Chip Handling and Oil Reclamation Systems

Hundreds of companies report big savings—

- "Saving $300 daily in scrap handling cost alone."
- "Saved $15,850 in 3 months on reclaimed oil."
- "Two men load car with 50 tons of chips in 20 minutes."
- "$40,000 scrap disposal unit paid off in one year."

A company handling 5 tons of metal chips per day amortized a $16,000 *National* installation in one year. Similar savings have been recently made by Ford, General Motors, Fafnir Bearing Co., Standard Pressed Steel Co., and Chicago Pneumatic Tool Co., to name only a few. Yes, modern chip handling and oil reclamation equipment can give you the biggest single cut in your manufacturing costs.

National makes equipment to handle all forms of metal chips – steel turnings, cast iron borings, aluminum, brass or copper turnings. In addition, *National* has designed specialized equipment to solve almost every problem in the handling of scrap metals and cutting oils.

National has a 25-year reputation, too, for expert servicing and quick delivery of replacement parts . . . plus free yearly check-ups.

National CONVEYORS COMPANY INC
FAIRVIEW, BERGEN COUNTY, N. J.

Send for National's free Bulletin 1-55 today . . . consult our catalog in Sweet's Machine Tool Catalog File — or contact our nearest representative.

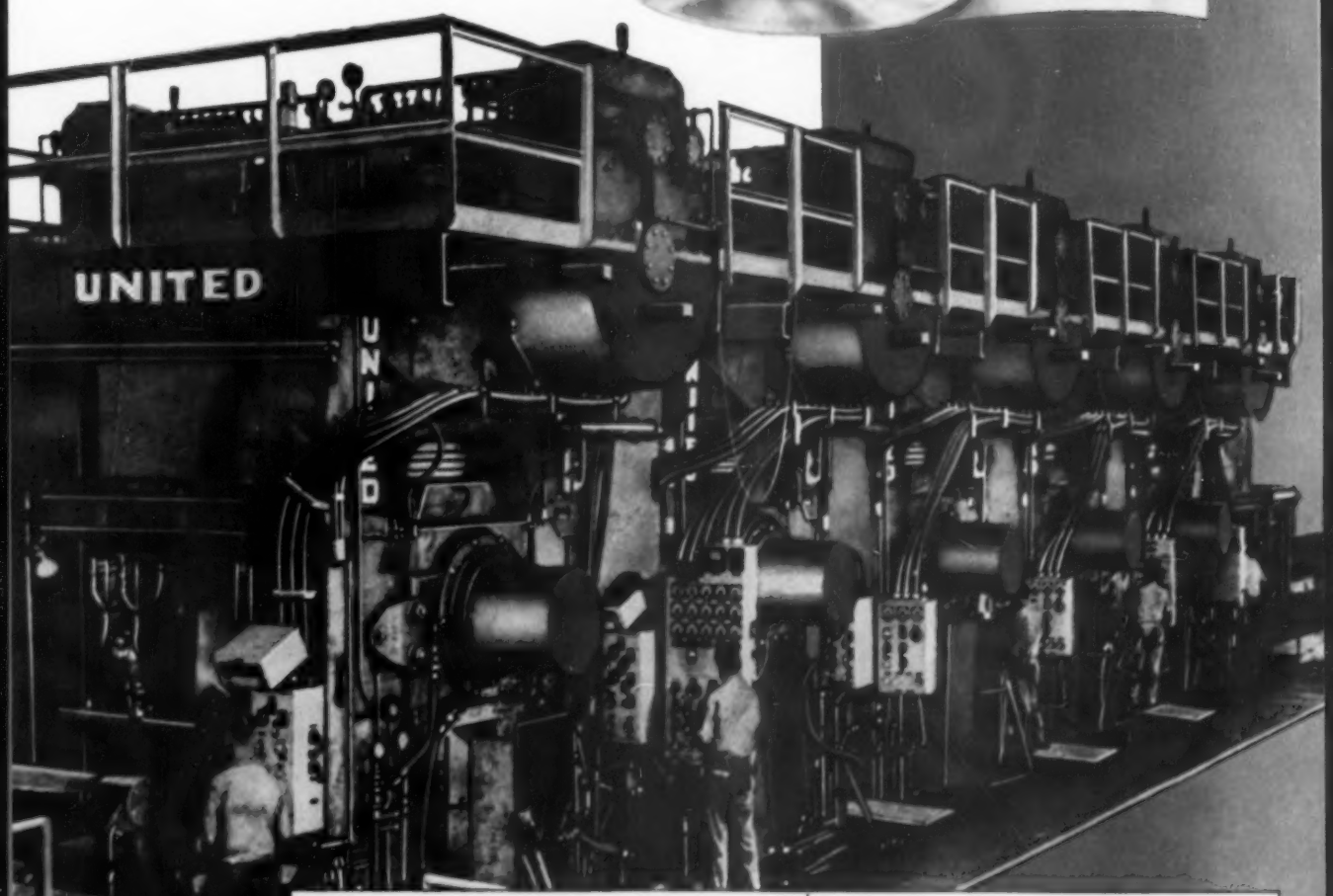
Manufacturers of Ash Conveyor Systems and Pneumatic Systems for handling granular materials.

BALTIMORE 18, Md. — Lamb Engineering Co. — 2125 Maryland Ave. • **BOSTON, Mass.** — Edgar D. Hinton — P.O. Box 167, Winchester, Mass. • **BUFFALO 2, N. Y.** — Charles P. Hague, Inc. — 570 Delaware Ave. • **CHARLOTTE, N. C.** — E. L. Mountcastle — 2617 Selwin Ave. • **CHICAGO, Ill.** — Mayer and Oswald, Inc. — 407 S. Dearborn St. • **CINCINNATI 27, Ohio** — Smith E. Hughes — 3716 Petoskey Ave. • **CLEVELAND, Ohio** — J. Harry Haywood — 12031 Edgewater Dr. • **DETROIT, Mich.** — Beltaire-Drisson — 2055 W. Grand Blvd. • **HARTFORD, Conn.** — Dee Engineering Co. — Cromwell, Conn. • **KANSAS CITY 12, Mo.** — W. C. Carolan Co. — 612 W. 47th St. • **LOS ANGELES 13, Calif.** — W. F. Huff and Co. — 417 S. Hill St. • **PHILADELPHIA, Pa.** — C. V. McQuary — P.O. Box 52, Cheltenham, Pa. • **PITTSBURGH 22, Pa.** — McQuiston and Gibson — Renshaw Building • **ST. LOUIS 22, Mo.** — Mador, Inc. — 10408 Manchester Ave.

UNITED®

4-HIGH, 5-STAND
CONTINUOUS

COLD STRIP MILL



designed and built by

UNITED

ENGINEERING AND FOUNDRY COMPANY

Pittsburgh, Pennsylvania

Plants at—Pittsburgh • Vandergrift • Youngstown • Canton
Wilmington (Lobdell United Division)

SUBSIDIARIES: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Company, Inc., Aurora, Indiana

Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

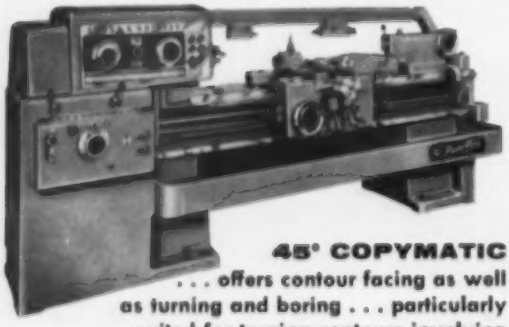
TAKE YOUR CHOICE . . .

45° OR 90° *Powerturn* COPYMATICS

LODGE & SHIPLEY TRACER CONTROLLED LATHES

Lodge & Shipley produces both these versatile duplicating lathes! Now, choose the type that perfectly suits your production. Speaking of production, these new lathes really produce at low cost. They combine proven advantages of all-hydraulic duplication . . . featuring either 45° or 90° tracing slide . . . with all the new POWERTURN features.

There are 5 new sizes and types of COPYMATICS suitable for your needs. Complete details are available in two new pieces of literature: Bulletin 309, 90° COPYMATIC and Bulletin 310, 45° COPYMATIC. For your copies, address: The Lodge & Shipley Company, 3055 Colerain Ave., Cincinnati 25, Ohio.



45° COPYMATIC
. . . offers contour facing as well as turning and boring . . . particularly suited for turning contours involving diameters connected to faces by curves!

90° COPYMATIC
. . . traces in both directions: toward head or tail . . . faces exactly square shoulders . . . maximum versatility and tracing capacity!

more than ever before . . .
your LODGE-*ical choice is* **Lodge & Shipley**

The Iron Age SALUTES

Alfred L. Boegehold

For over 30 years he has done outstanding work in the field of automotive metallurgy. His achievements have won him high honors and helped the industry go places in a hurry.

Alfred Boegehold is a quiet, modest man. He plays golf, likes pinochle, has a reputation for passing along credit to the other fellow. Mr. Boegehold is a metallurgist. He figures out the best kind of metal to go into a car and the best kind to be used in car production.

He's very good at his work. Has to be. Assistant to the vice president in charge of General Motors' research staff, he's in a position where any mistake would be a big one. But Mr. Boegehold is thorough and patient. His 30-year record of auto metallurgy shows a knack of coming up with the right answer. He was in on the development of Gmoodie, a zinc die material with good casting and wearing properties. His work with malleable iron has permitted increased use of the material in crankshafts and other heavy sections.

During the war he came up with a specifying concept that reduced use of strategic materials. Since the war he has helped develop jet engine alloys and an aluminum dipping process for steels. He holds numerous patents, has turned out technical papers on wear testing of cast iron, endurance of gear steels and many other subjects. He is past president of the American Society for Metals, received ASM's 1955 Gold Medal for "great versatility in applying science to the metal industry."

Mr. Boegehold was born in Mount Vernon, N. Y., received a mechanical engineering degree from Cornell in 1915. He worked for Remington Arms and Ammunition Corp., Bridgeport Brass Co., Remington Union Metallic Cartridge Corp., and Army Ordnance before coming to General Motors in 1920. Five years after joining GM's research staff, he was named head of the company's metallurgical engineering department.

Mr. Boegehold is a family man. When he retires, he'll probably settle down somewhere on Long Island Sound and go sailing. Meanwhile he continues in his quiet, steady way to provide metallurgical answers to performance and production needs of big, fast automobiles. People who never heard of Gmoodie or aldip will live a little better because of his work.

FACTS ABOUT Exide®
IRONCLAD® INDUSTRIAL TRUCK BATTERIES

SPEED UP "SET UPS" ...GET FASTER PRODUCTION!

ELECTRIC TRUCKS POWERED WITH EXIDE-IRONCLADS GIVE YOU THE MOST DEPENDABLE, LOWEST-COST METHOD OF MOVING LARGE DIES, MAKING MACHINE SET-UPS FASTER, SAFER, EASIER. IRONCLADS DELIVER AMPLE POWER INSTANTLY, ENSURING SMOOTH, PRECISE MATERIALS HANDLING. TRUCKS WORK THROUGH TO THE LAST MINUTE OF THE SHIFT... WITH NO UNSCHEDULED DOWN-TIME. LOWER COSTS FOR OPERATION, MAINTENANCE AND DEPRECIATION MAKE EXIDE-IRONCLADS YOUR BEST POWER BUY— *AT ANY PRICE!*

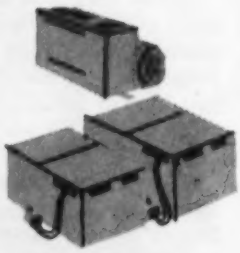
TUBES OF POWER

INSIDE EVERY IRONCLAD ARE SLOTTED TUBES THAT KEEP THE ACTIVE MATERIAL IN FIRM CONTACT WITH CONDUCTING GRIDS OF THE POSITIVE PLATES. THE ELECTROLYTE FLOWS EASILY THROUGH THESE NON-CORRODING SLOTS TO REACH MORE ACTIVE MATERIAL FASTER. RESULT: AN IRONCLAD DELIVERS GREATER POWER... FOR A LONGER TIME... AT LOWEST COST!

- PROTECTED SILVIUM CONDUCTING GRID
- COMPRESSED ACTIVE MATERIAL
- SLOTTED POLYETHYLENE RETAINER TUBE

LET EXIDE HELP SOLVE YOUR INDUSTRIAL TRUCK BATTERY PROBLEMS. ❶ CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ❷ WRITE FOR FORM 1982, A MANUAL ON INSTALLING AND MAINTAINING MOTIVE POWER BATTERIES.

NOW! CASH OUTLAY FOR ELECTRIC TRUCKS CUT DRASTICALLY BY NEW EXIDE PLAN!



BUY ONLY THE TRUCK CHASSIS! CUT INITIAL CAPITAL OUTLAY AS MUCH AS 33⅓%!

LEASE EXIDE-IRONCLAD BATTERIES AND CHARGER!

IN ADDITION TO THE SUPERIOR OPERATION OF ELECTRIC TRUCKS YOU GET BIG ANNUAL SAVINGS. A TYPICAL EXAMPLE OF HOW MUCH YOU SAVE EACH YEAR WITH ELECTRIC TRUCKS AND THE EXIDE PLAN:

1 TRUCK ON 3-SHIFT OPERATION SAVES $1425.76!

MAKE US PROVE THESE SAVINGS! CALL YOUR EXIDE SALES ENGINEER. ASK YOUR ELECTRIC TRUCK SALESMAN. WRITE FOR COMPLETE DETAILS ON THE EXIDE LEASING PLAN!

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

FIELD REPORT: NO. 91

WHICH DIE STEEL WOULD YOU USE HERE to increase production from 100 to 23,000 parts?

Even after trying many different die steels, production averaged only about 100 pieces before this ring die had to be replaced.

The die cold forms cups as the first operation in producing rocket projectile noses from SAE 1010 Steel. Even though the ring die is press fitted into a four foot diameter hardened retainer ring (Rc. 34/36), the 1700 tons of pressure exerted in power extrusion prematurely stretches the die. The 12 lb. 2 oz. cups must be held within .2 of a lb. and wall thickness within .010".

Which die steel would you specify in a move to cut replacement costs and improve production?

From our customer Field Report files, here's how the toolroom solved the problem. The Carpenter Matched Set Method showed that Carpenter VEGA (Air-Tough) Die Steel was a natural for the job. Latest report shows that the VEGA ring die had increased production from 100 to 23,000 cups, and is still banging them out.

What better guarantee of success can you find for your own jobs than the word of hundreds of toolroom men who rely on Carpenter. Why settle for "ordinary" results when Carpenter is ready to help you explore the possibility for improvement? Call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor now. *The Carpenter Steel Co., 121 W. Bern St., Reading, Pa.*

How can <u>your</u> toolroom use Carpenter Matched Tool and Die Steels to:

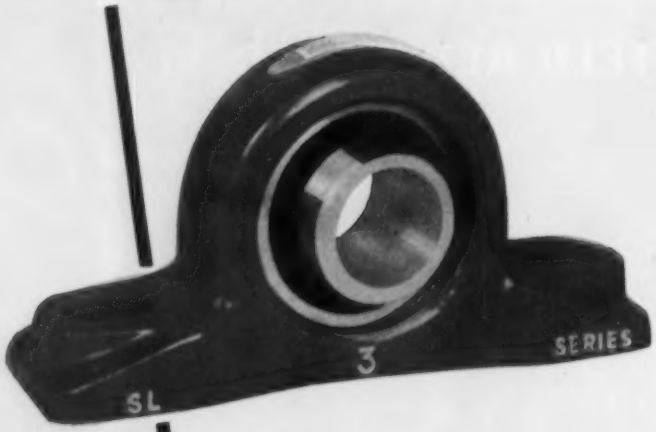
Reduce hardening hazards
Minimize machine downtime
Boost output per grind
Improve product quality

Carpenter STEEL

Matched Tool and Die Steels

IMMEDIATE DELIVERY from local warehouse stocks — Export Address: Port Washington, N. Y. — "CARSTEELCO"

IT'S NEW IT'S POLLARD SELF-LUBE



BALL BEARING PILLOW BLOCK AND FLANGE UNITS

Self Aligning

Self Sealed

Self Lubricated

SUITABLE FOR ½" SHAFT DIAMETER TO 6" SHAFT DIAMETER IN ½" STEPS.

The POLLARD "SELF-LUBE" sealed bearing design offers the MAXIMUM duty, for the MINIMUM of attention and outlay. It can be stated that 90% of bearing failures are due to the ingress of foreign matter, and by reason of the great strides which have been made in the manufacture of special lubricants, it has been possible to provide a bearing mounting requiring no servicing whatsoever. The one piece housing and solid sleeve, enables the bearing to be fitted as a complete unit, there by eliminating the hazards of an exposed bearing. Further, the improved sealing devices are of the flexible type bonded to a metal insert, ensuring long trouble free service and are not called upon to align themselves to the malalignment of the bearing housing. This bearing unit gives a life equal to, or greater, than the standard open type bearing of similar size, periodically lubricated, and is available from ½" to 6" shaft diameter. Flange units incorporating the same advantages as outlined above are also available. The lower drawing, illustrates the flange unit design. Catalogue SL/2/54 giving further details is available on application to Room B.2. Technical Sales Dept. London, England, or Montreal.

The Iron Age INTRODUCES

Neil J. Ranney, elected president, **Production Machinery Corp.,** Mentor, O.

William F. Wolf, elected vice president and manager, Machine Tool Div., **Harron, Rickard & McCone,** Calif.

Leo F. Hagerty, appointed assistant president, **Solar Steel Corp.,** Detroit area.

David S. Jennings, elected president and treasurer, **Central Screw Co.,** Chicago; **Ross B. Warren,** appointed executive vice-president and assistant treasurer; **Ernest Payne,** elected vice-president, sales; **Ray E. Nelson,** appointed secretary; **Walter E. Grandstrand,** appointed assistant secretary.

Harry E. New, elected president and treasurer, **Palmetto Steel & Machine Co.,** Greenville, S. C.

Harold E. Schlenker, appointed vice-president, sales, **Accurate Die Casting Co.,** Cleveland; **John W. Vanek,** elected vice-president, in charge of engineering.

Wilfred A. Smith, named products sales manager, Industrial Products Div., **B. F. Goodrich Co.,** Akron, O.

J. D. Harmison, appointed manager, part sales, tractor group, **Allis-Chalmers Mfg. Co.,** Milwaukee; **Frank Jones,** appointed tractor sales manager, Farm Equipment Div.

Donald K. Smith, named sales manager, mechanical division, Steel & Tubes Div., **Republic Steel Corp.,** Cleveland; **Paul G. Miller,** appointed central district sales manager, Steel & Tubes.

D. M. Hallier, named manager, cutting tools, **The Motch & Merryweather Machinery Co.,** Cleveland.

Russell W. Sloan, appointed manager, commercial development, **Pennsylvania Salt Mfg. Co.,** Philadelphia.

John W. Rogers, appointed director, sales and engineering, **Wean Equipment Corp.,** Cleveland; **Albert J. Sarka,** named chief development engineer; **Kenneth R. Keska,** appointed chief engineer; **William P. Donald,** named assistant chief engineer, design; **Donald H. Turk,** appointed chief design engineer.

R. N. Hillner, appointed manager, standard product sales, **The H. M. Harper Co.,** Morton Grove, Ill.; **John A. Stevenson,** appointed manager, technical sales, Aero Div.

J. W. KINNEAR, JR., elected vice-president, operations, Tennessee Coal & Iron Div., U. S. Steel Corp.

NEAL J. CRAIN, elected vice-president, in charge of purchases, United Engineering and Foundry Co., Pittsburgh.

A. L. BILLETER, appointed assistant vice-president, operations-steel, U. S. Steel Corp.

ROBERT A. McCLURE, appointed general superintendent, Gary Sheet & Tin Mill, U. S. Steel Corp.

for stampings...

FOLLOW THE LEADERS

wherever you are!

REFRIGERATION

AIRCRAFT

PHOTOGRAPHIC

ELECTRICAL

AUTOMOTIVE

HEATING—VENTILATING

How can you go wrong by following the leading manufacturers of widely-diversified products?

Many of them buy their quality-stampings from us . . . and have done so for years!

And their plants are located . . . literally . . . from coast to coast.

So, if you want to follow these leaders to quality stampings . . .

You'll find a friendly, talented and ideally-equipped company ready to give you a warm welcome . . .

Wherever you're located!

DETROIT STAMPING COMPANY

DE-STA-CO

345 Midland Ave., Detroit 3, Mich.

Phone — TOwnsend 8-5080

• AMERICA'S BEST KNOWN JOB STAMPING MANUFACTURER

PERSONNEL

Robert Maxwell, appointed executive vice-president, **Chandler Boyd Co.,** Pittsburgh.

Lester E. Johnson, named supervisor, industrial chemicals section, Development & Research Div., **The International Nickel Co., Inc.,** New York.

Dick A. Miller, named plant superintendent, Bassick-Sack Div., **The Bassick Co.,** Winston-Salem.

James W. Hughes, named manager, regional industrial sales, midwest region, **Minneapolis-Honeywell Regulator Co.,** Chicago; **Raymond A. Zack,** named industrial sales manager, Hammond, Ind.; **Paul R. Sharadin,** appointed regional application engineer, southwestern region, Dallas.

D. T. Meisel, named advertising manager, **Whitman & Barnes, Inc.,** Plymouth, Mich.

Henry J. Barbour, appointed manager, advertising and public relations, **Fairbanks Morse & Co.,** Chicago.

Dr. Robert B. O'Connor, appointed medical director, **U. S. Steel Corp.,** Pittsburgh; **R. Conrad Cooper,** elected vice-president, administration planning; **John F. Angle,** appointed vice-president, industrial engineering.

Jasper F. Burt, appointed plant manager, La Porte Aircraft Div., **Whirlpool-Seeger Corp.,** La Porte, Ind.

Samuel H. Greenwood, appointed field sales manager, **F. J. Stokes Machine Co.,** Philadelphia; **Fred Hillsley,** named district manager, Philadelphia territory.

V. S. LAZZARA, appointed president, Investment Casting Institute.

EDWARD N. CASE, appointed sales manager, Ajax Electric Co., Philadelphia.

EDWIN C. McDONALD, appointed assistant chief combustion engineer, Republic Steel Corp., Cleveland.

HARVEY WILGUS, appointed general sales manager, The Electric Products Co., Cleveland.

Lamson

1035 CAP SCREWS OFFER GREATER STRENGTH AT...

Less Cost!

If you are now using Full Finished Screws in your assembly operations it will pay you to consider substituting Lamson 1035 Double Heat Treated Cap Screws.

The extra relative toughness of Lamson 1035's enables you to use screws of smaller diameter, yet with equal, or greater, tensile strength.

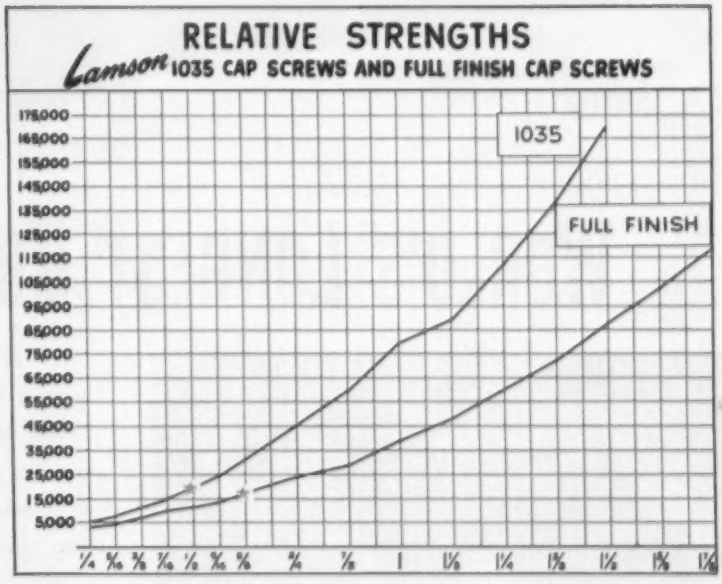
As an example of increased strength at less cost—on the chart below you will see that a ½"* diameter Lamson 1035 Cap Screw has greater tensile strength than a ⅝"* diameter Full Finished Cap Screw. This means savings in weight and size of assembly.

As for money savings—Lamson ½" x 2" 1035 Cap Screws are net priced at $5.36 per hundred as compared to $7.59 per hundred for the ⅝" x 2" Full Finished Screw. Proportionate savings can be made all along the line.

Lamson 1035 Double Heat Treated High Tensile Cap Screws have long been favorites where extra strength and durability is required.

To attain this extra strength, Lamson Cap Screws are first heat treated at about 1600° F. and then quenched. This imparts "hardness". Then the screws are "drawn", or re-heated, to between 900° F. and 1100° F. and then quenched in a special oil.

This results in a minimum tensile strength of 150,000 pounds per square inch.



Lamson & Sessions

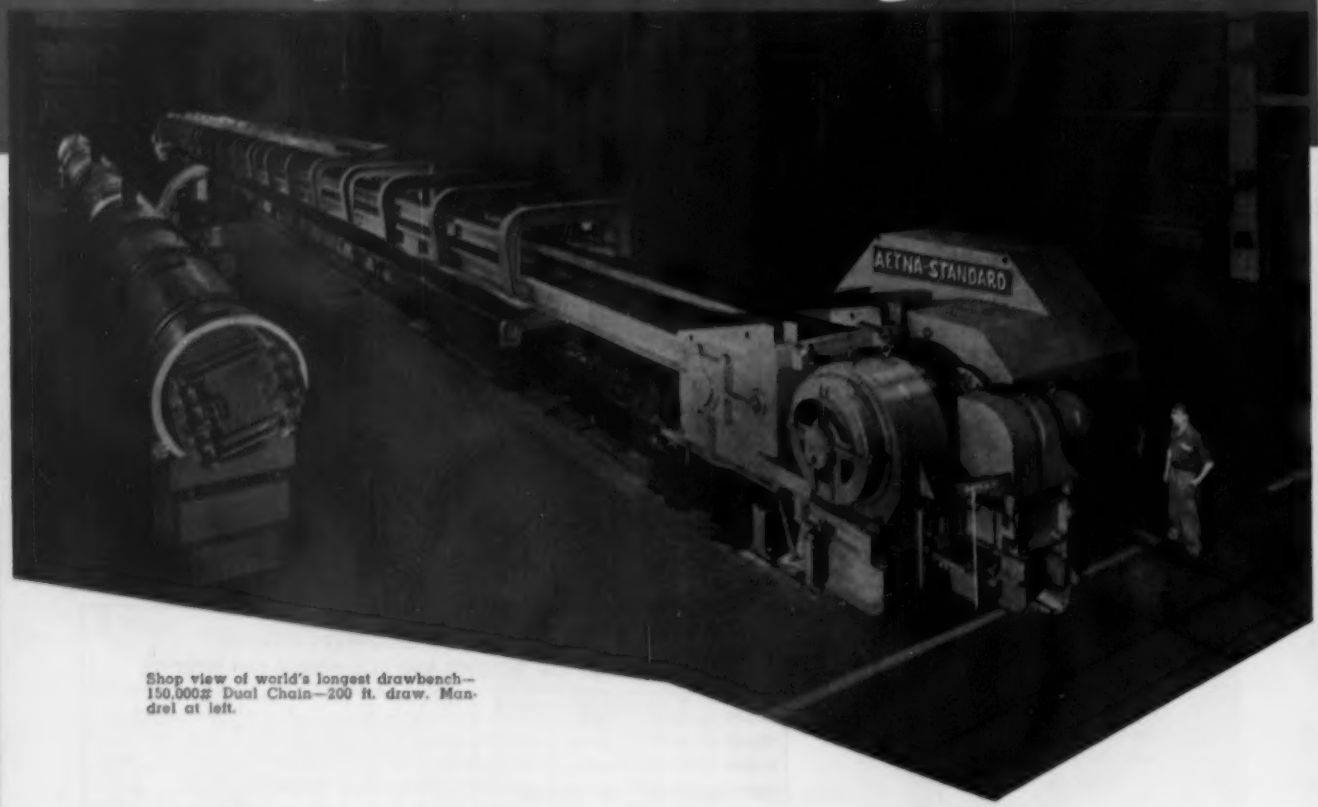
YOU GET MORE WHEN YOU BUY FROM . . .

The LAMSON & SESSIONS Co.

1971 West 85TH St. • Cleveland 2, Ohio

CLEVELAND AND KENT, OHIO • BIRMINGHAM • CHICAGO

Always Something NEW



Shop view of world's longest drawbench—150,000# Dual Chain—200 ft. draw. Mandrel at left.

WORLD'S LONGEST DRAWBENCH

106 representatives of 37 companies from America and Canada visited Aetna's Ellwood City, Pa., plant to see the demonstration.

200 ft. draw at speeds up to 350 FPM — the world's longest drawbench. This 150,000# Dual Chain, first of its kind and size, can draw five tubes at once at speeds up to 350 FPM. The bench, used primarily for breakdown passes, furnishes long lengths of tubing to the Bull Block (opposite page). Designed and manufactured by Aetna-Standard in cooperation with Chase Brass & Copper Co. The world over, Aetna-Standard is known as "the idea people" and leading manufacturer of Cold Draw Equipment for Tubes and Bars.

(OTHER SPECIFICATIONS)

DRAW SPEEDS: 110—165—220—330 FPM.

MAX. TUBE LENGTH: 150 ft. before draw, 200 ft. after draw.

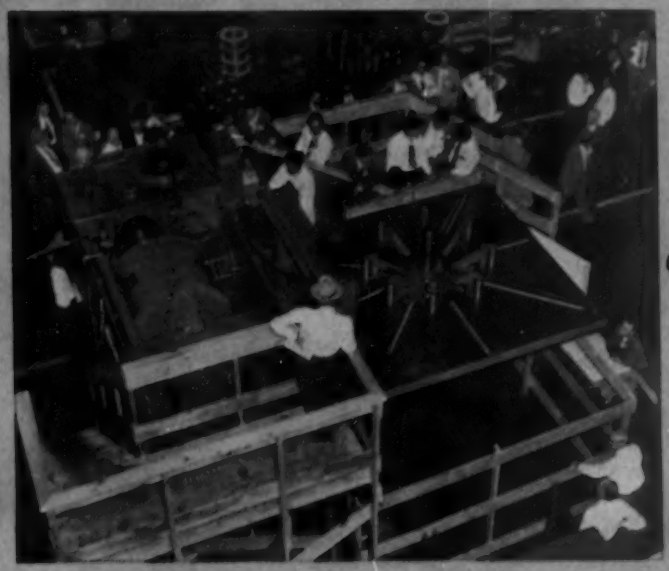
MAX. DIE SIZE: 14" O.D. Single Draw; 6" O.D. Triple Draw and 6" O.D. Five Draw.

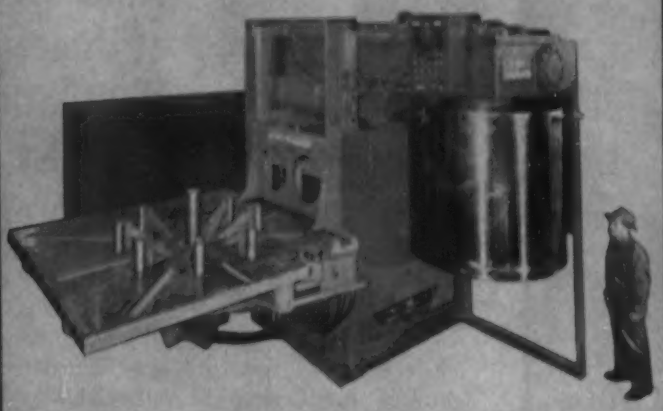
LOADING RACK CAPACITY: 100—3" O.D. Tubes.

CARRIAGE AND HOOK: Air Operated.

at Aetna-Standard

. . . the Idea People





Two views at Aetna's new Inverted Bull Block for production of thin wall, smaller diameter copper tubes.

INVERTED BULL BLOCK

The strong demand for thin wall, small diameter copper tubes created a need for a new type and size of Inverted Bull Block. Designed and built by Aetna, the Bull Block has a drum diameter of 60" x 52" working face; drawing speeds of 150 to 2,000 FPM. A typical drawing cycle starts with 1.234" O.D. x .055" wall, finishing in 8 passes to .249" O.D. x .029" wall. Aetna furnished three of these Inverted Bull Blocks for Chase Brass & Copper Co.'s Cleveland, Ohio, plant. Additional equipment included Coil Handling Conveyors; Tube Loading Racks; Pointing and Cutting Auxiliary Equipment. The complete Aetna installation at Chase includes: The world's longest drawbench (described opposite page); one 36,000# Dual Chain Bench, 5-Draw—130 ft. lengths at speeds up to 400 FPM; two 8,000# Single Chain Benches for 50 ft. drawing at two speeds—200 and 400 FPM.

OTHER AETNA PRODUCTS

In each of six equipment categories, Aetna-Standard is known as "the idea people": Continuous Butt Weld Pipe Mills; Seamless Tube Mills; Continuous Galvanizing and Electrolytic Tinning Lines; Finishing Equipment for Sheet and Strip; Cold Drawing; Rubber and Plastic.

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Aetna-Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

Screw Machine Products Plant, Aluminum Co. of America, Lancaster, Pa. This modern, windowless building is equipped with 49 All-Aluminum Burt Low Type Roof Ventilators.

Aluminum Co. of America Licks Ventilation and Oil Mist Problem

With Burt Low Type Ventilators

THE PROBLEM — The modern building design selected for Alcoa's new Screw Machine Products Plant is practically free of wall openings. Its 200,000 square feet of floor space has no cross circulation or natural ventilation. Production operations create considerable heat and oil mist.

THE SOLUTION — Forty-nine 48" all-aluminum Burt Low Type Roof Ventilators are used to maintain a pleasant working atmosphere the year around. Oil mist is scarcely discernible. Twenty-five of the Burt ventilators supply air. The remaining twenty-four function as exhaust ventilators.

COMPARATIVE COST — The high volume of air supply utilized here is relatively inexpensive. According to the Alcoa Staff Engineer for Air Conditioning, the initial cost of air supplied by the Burt Low Type Roof Ventilators is less than one-fourth that of a centralized duct system.

SUGGESTION — If you are looking for fresh air at low cost, investigate Burt's complete line of modern, efficient roof ventilators.

Send for **FREE** *Data Book!*

Write for Burt Data Book SPV-101-E. It supplies quick data on Burt's complete line of modern Roof Ventilators.

FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

The Burt Manufacturing Company

920 So. High St. Akron II, Ohio

MEMBER POWER FAN MANUFACTURERS ASSOCIATION

PERSONNEL

Calvin H. Corey, appointed vice-president, **Brooks & Perkins, Inc.,** Detroit.

Albert H. Clarke, appointed vice-president, engineering, **Crouse-Hinds Co.,** Syracuse, N. Y.

Wade H. Oldham, appointed blast furnace consultant, **Phoenix Iron & Steel Co.,** Phoenixville, Pa.

Norbert E. Willkomm, appointed acting manager, Hamilton Steel Warehouse, **Jones & Laughlin Steel Corp.**

T. H. Bartholomew, named manager, procurement dept., Tar Products Div., **Koppers Co., Inc.,** Pittsburgh.

James L. Yates, appointed district manager, midwest territory, **National Engineering Co.,** Chicago.

William P. Burke, appointed general manager, aluminum extrusion plant, **Hokin Aluminum Co.,** Dolton, Ill.

Robert G. Wingerter, appointed general manager, Automotive Div., **The Timken Roller Bearing Co.,** Canton, O.

Leonard T. Harris, named assistant sales manager, **Kensington Steel Co.,** Chicago.

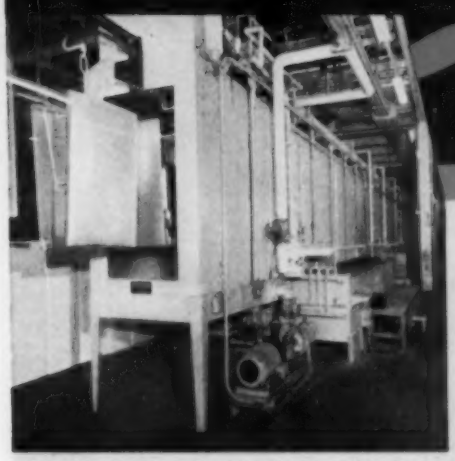
H. Charles Yaeger, appointed manager, manufacturing, Pesco Products Div., **Borg-Warner Corp.,** Bedford, O.

Robert M. Gordon, named general sales manager, **Milford River & Machine Co.,** Milford, Conn.

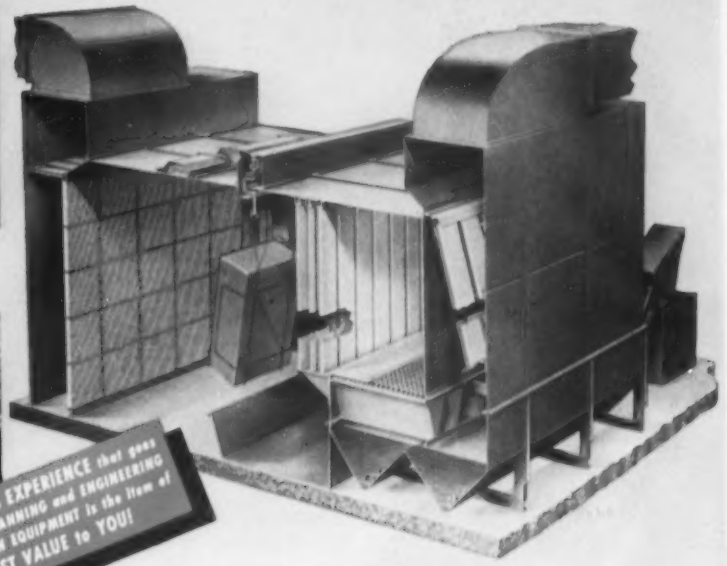
Donald Gibbons, appointed division manager, **The Aro Equipment Corp.,** Chicago and Northern Illinois.

COMPLETE *Finishing* SYSTEMS

. . . for ENAMELS • LACQUER • PAINT • VARNISH

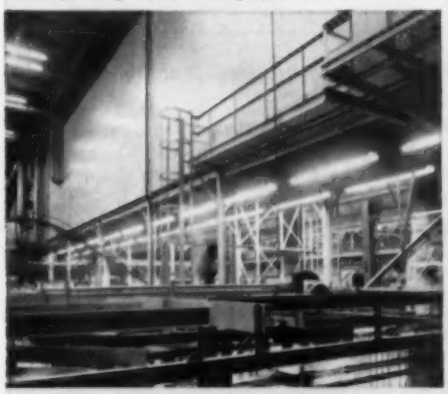


One of Two Mahon Seven-Stage Metal Cleaning and Rust Proofing Machines designed for processing Refrigerator Parts and installed in the plant of one of the world's largest manufacturers of Home Appliances.



. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!

One of Four Mahon TYPE 54 AC-F PUMPLESS Hydro-Filter Spray Booths installed in the Porcelain Enamel Finishing Line of the same manufacturer referred to above. Note tubular sludge unloading conveyor casing at bottom of sludge tank.



Mahon Double-Deck Overhead Frit Drying Oven in the Porcelain Enamel Finishing Line of the same manufacturer referred to above. Other Mahon equipment in this finishing operation includes Dry-Off Ovens, Cooling Tunnels, Brushing Booths, Touch-Up Booths, Filtered Air Supply System and other Special Items.

PUMPLESS Hydro-Filter SPRAY BOOTH is Highly Successful in FRIT SPRAYING OPERATIONS!

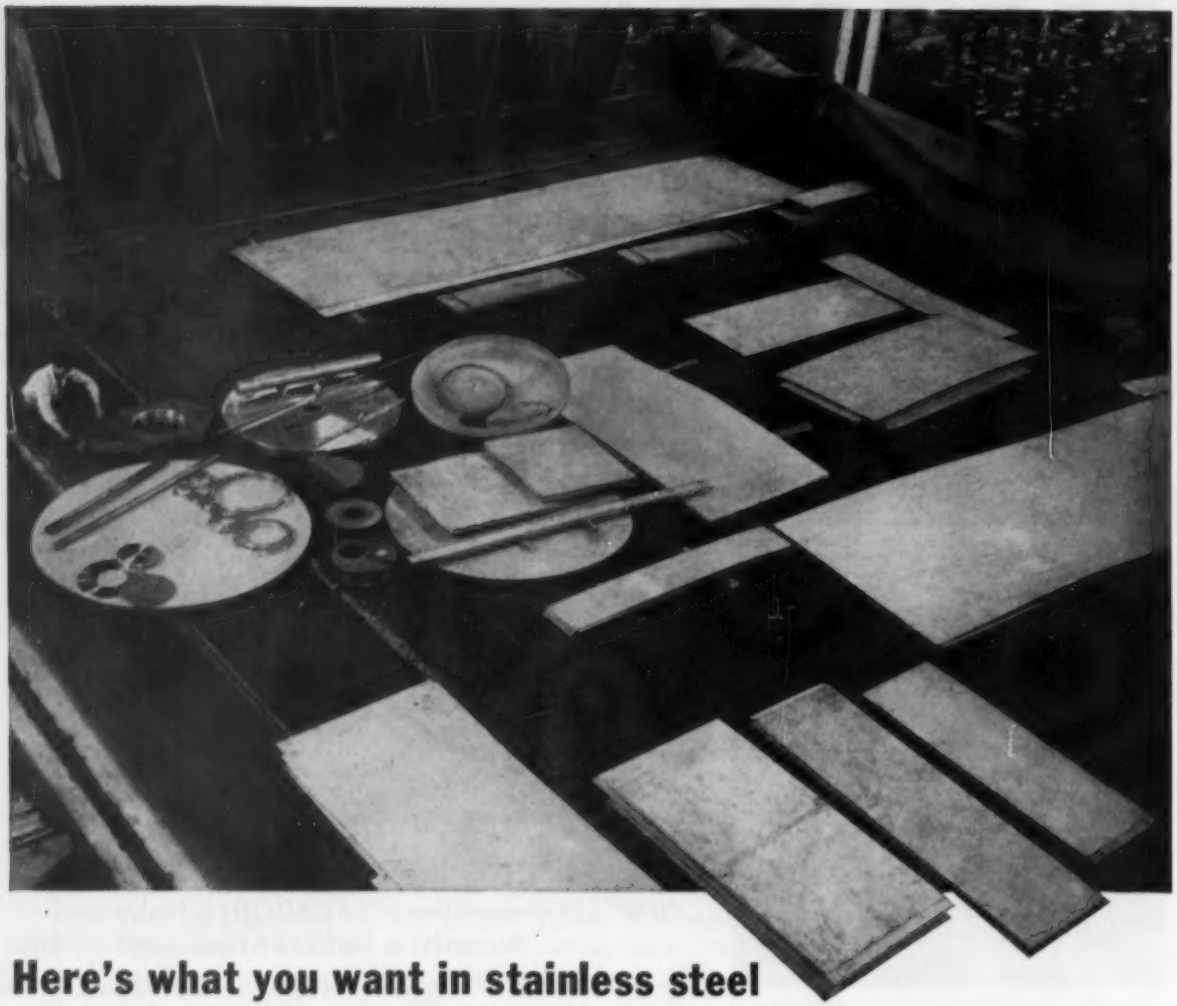
Mahon Type 54 AC-F Hydro-Filter Spray Booth, designed especially for Frit Spraying in porcelain enameling operations, is a departure from the conventional water-wash spray booth. There are no recirculating pumps. The normal exhaust fan, used to ventilate the spray booth, provides the washing action through air accelerators which impinge the airborne frit particles into the surface of the water in the sludge tank. Dry baffle plates are provided in front of the Hydro-Filter chamber for maximum recovery of Frit. The bottom of the sludge tank is in the form of two "V" shaped hoppers with the continuous conveyor of the automatic sludge unloader at the bottom. In the development of Type 54 AC-F, Mahon engineers have not only produced a highly effective Frit Booth, but, through elimination of high pressure pumps and the addition of the automatic sludge unloader, have reduced operating cost and maintenance to an absolute minimum. If you have a finishing problem, or are contemplating new finishing equipment, you will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . and better qualified, also, to do the all-important planning and engineering of equipment—which is the key to fine finishes at minimum cost. No matter what you paint, or by what process, Mahon equipment will serve you better . . . because its engineered better and built better for more economical operation over a longer period of time. See Mahon's Insert in Sweet's Plant Engineering File, or write for Catalog A-656.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES ENGINEERING OFFICES in NEW YORK and CHICAGO

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems, Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON



Here's what you want in stainless steel —the way you want it

Stainless Steel Plate . . . produced to almost any size or thickness, ⅜" and heavier, in rectangles or cut-to-shape. Carlson maintains what is probably the largest stock of stainless plate in the country—produced to highest chemical and metallurgical standards —ready for cutting to your requirements, and for shipment when you want it.

Stainless Steel Heads . . . spun or press formed to your order or taken directly from our stock of ASME and Standard flanged and dished heads—the *largest stock* maintained anywhere. In addition to supplying heads for tanks, heat exchangers, condensers and similar equipment, Carlson can fill a complete bill of material including shell plates, flanges, rings, pads and other components.

Stainless Steel Forgings, Circles, Rings, and Special Patterns . . . Flanges, circles, rings, and sketch plates are cut from plate, or forged and rough machined to meet your specifications.

Stainless Steel Bars and Sheets (No. 1 Finish)

Complete Service . . . At Carlson the emphasis is on flexibility, efficiency and economy in producing what you want, when you want it. If you would like additional information about our service and products or, if you want *to place an order*—just let us know, we promise you prompt action!

write for CARLSON'S WEEKLY STOCK LISTS . . . YOUR GUIDE TO WHAT'S AVAILABLE IN QUALITY STAINLESS STEEL

Stainless Steels Exclusively

G. O. CARLSON, INC.

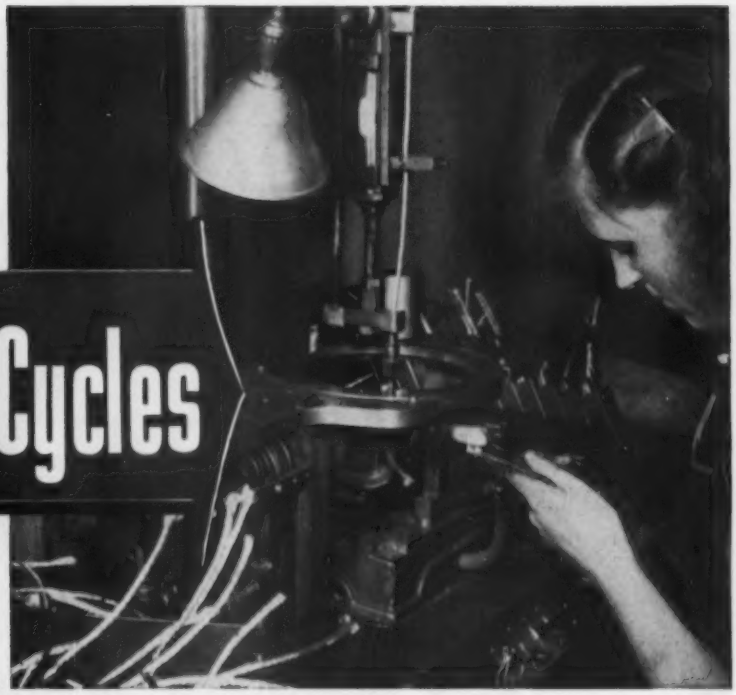
THORNDALE, PENNSYLVANIA

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

District Sales Offices in Principal Cities

How's this for Air Cylinder Economy?

31,000,000 Cycles



...in an atmosphere laden with carbon dust

Carbon dust is highly corrosive. Few air cylinders can withstand its ruinous effects. But the Bellows Air Motor — the air cylinder with the built-in valve — has completed more than 31,000,000 cycles in the plant of Electronite Carbon Co., Philadelphia — and is still going strong.

But the exceptional durability of the Bellows Air Motor on this installation is only a small part of the story.

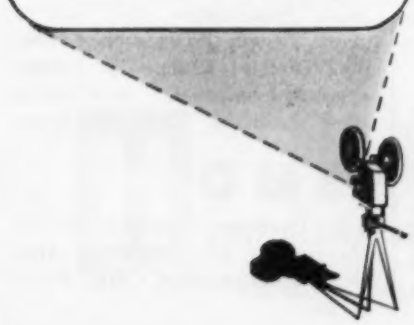
This special machine, designed and built by Bob Silver, Electronite's Chief Engineer, uses a Bellows Air Motor to tamp wire shunts into carbon brushes. And in brushes, shunt contact must be perfectly matched to assure uniform distribution of current load. The Bellows Air Motor provides the day-after-day repetitive accuracy required for constant uniformity. Rejects dropped from 10% to one-half of 1%.

And, in addition, as Bob Silver put it, "We get at least two to four times the speed of production using the automatic method."

The Bellows Air Motor and its related "packaged" power units: rotary and linear work feeders, work holding devices, drill units, etc., make tool-room design and construction of special production machines practical and inexpensive for both long and short run operations — multiply fractional savings into an impressive cost reduction figure.

OPERATION PUSHBUTTON

The story of Electronite Carbon Co. is but one of many dramatic uses of "Controlled-Air-Power" featured in the new motion picture, "Operation Pushbutton." This half-hour 16 mm sound picture shows how industries all over the United States and Canada are applying engineer ingenuity to production processes. We'll be happy to arrange a showing for you. Write The Bellows Co., Dept. IA 1155, Akron 9, Ohio, or phone your local Bellows Field Engineer.

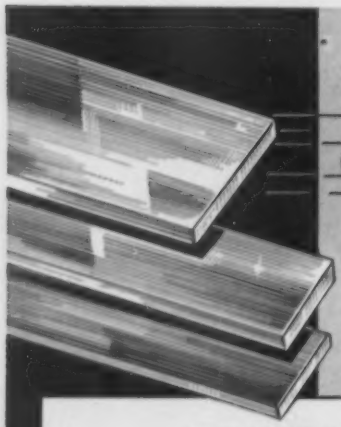


1187-A

The Bellows Co.

AKRON 9, OHIO

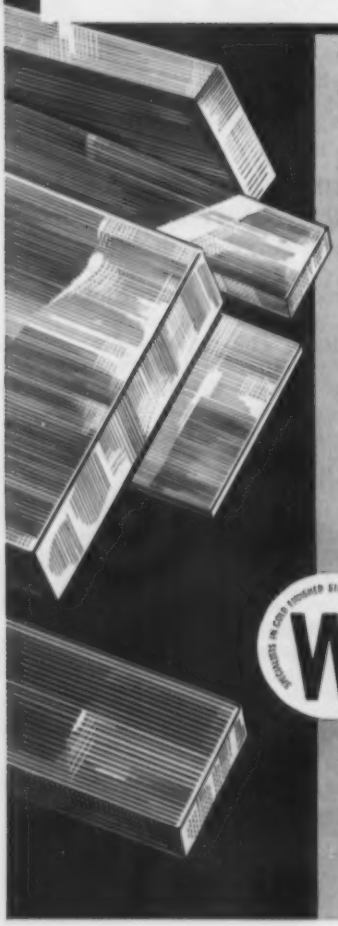
Bellows Pneumatic Devices of Canada, Ltd., Toronto



speed

YOUR PRODUCTION
AT LOWER COST
WITH—

WYCKOFF
Cold Drawn CARBON & ALLOY
WIDE
FLATS
UP TO 2" x 12"



Wyckoff Precision Wide Flat Sections are cold drawn to close tolerances and will definitely reduce your machining and assembly costs for gauges, gigs and fixtures, machine tool bases, die plates, and other heavy machinery parts.

WYCKOFF
QUALITY CONTROL
Insures

- Accuracy of Section
- Square Corners to Your Needs
- Straight Edges
- Smooth Uniform Surfaces
- Furnace Treatment to Your Specifications

WYCKOFF STEEL CO.
GENERAL OFFICES:
Gateway Center, Pittsburgh 30, Pa.
Branch Offices in Principal Cities
Works: Ambridge, Pa. • Chicago, Ill.
Newark, N.J. • Putnam, Conn.

WYCKOFF STEEL PRODUCTS—Carbon and Alloy Steels • Turned and Polished Shafting
Turned and Ground Shafting • Wide Flats up to 12" x 2" • All types of furnace treated Steels

Glenn K. Rosenfelder, appointed manager, Central Sales region, **McKinney Mfg. Co.,** Chicago.

John Newitt, named general manager, **Kinetics Corp.,** Hingham, Mass.

Clement N. Williams, appointed assistant sales manager, **Lewis-Shepard Products, Inc.,** Watertown, Mass.

Belmont Towbin, elected director, **Induction Motors Corp.,** Westbury, N. Y.

Blenn F. Cook, appointed assistant director, industrial relations, Michigan Limestone Div., **U. S. Steel Corp.,** Detroit.

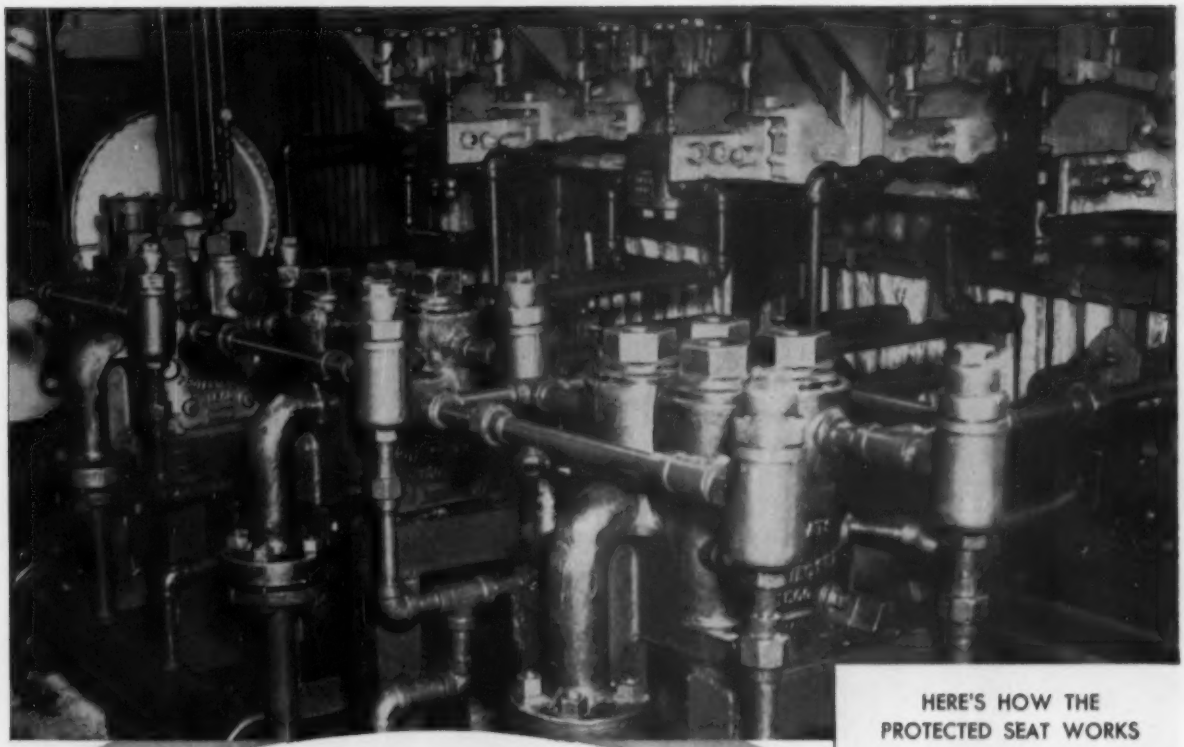
Earl F. Lowe, Jr., appointed general superintendent, Duluth plant, **Interlake Iron Corp.,** Duluth, Minn.

Edmond S. Bauer, named assistant sales director, resin products, Plastics Div., **Monsanto Chemical Co.; Thomas W. Sears,** appointed sales manager, industrial resins, Plastics Div.

Herbert A. Merrill, appointed chief inspector, quality control, **Portland Copper & Tank Works, Inc.,** S. Portland, Me.

Claude Baker, appointed sales representative, reinforcing steel dept., Washington steel service plant, **Joseph T. Ryerson & Son, Inc.,** Seattle; **George W. Porter,** appointed manager, reinforcing steel products dept., Spokane, Wash.

T. Coolidge Sherman, named Washington representative, **Allegheny Ludlum Steel Corp.,** Pittsburgh.



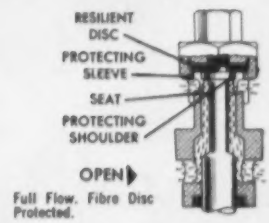
for fast, smooth, accurate control

Specify HOMESTEAD *Protected Seat* HYDRAULIC OPERATING VALVES

RECORDS OF 6 TO 18 MONTHS' MAINTENANCE-FREE SERVICE ARE COMMON

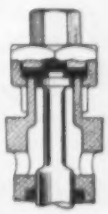
It will pay you to get the facts about HOMESTEAD Protected-Seat HYDRAULIC OPERATING VALVES—the valves that give you quick, finger-tip control for moving or positioning any single-acting or double-acting hydraulic piston. The exclusive Homestead Protected-Seat reduces fluid velocity during the closing operation to practically zero. Thus seat erosion and resultant leakage, the most frequent cause of shut-downs and lost production time, is eliminated. Records of 6 to 18 months continuous service without maintenance are common.

HERE'S HOW THE PROTECTED SEAT WORKS



OPEN ▶
Full Flow. Fibre Disc Protected.

CLOSING OR ◀ OPENING
Flow practically stopped by close fitting sleeve and stem shoulder, before seat and disc make contact. This prevents "wire drawing." Trapped water cushions closing, dampens hydraulic shock.



CLOSED ▶
Protected resilient disc against metal seat assures drop-tight seal, long life, accurate control, and low maintenance.

For full particulars, **MAIL THE COUPON TODAY.**

Please send me without obligation, complete data on PROTECTED-SEAT HYDRAULIC OPERATING VALVES.

NAME_____

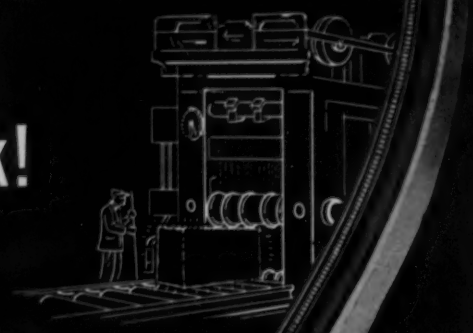
COMPANY_____ TITLE_____

ADDRESS_____

CITY_____ STATE_____

HOMESTEAD
VALVE MANUFACTURING COMPANY
"Serving Since 1892"
P.O. BOX 23, CORAOPOLIS, PA.

Snug fit for a big neck!



PROTECTS AGAINST TORRENTIAL DOWNPOUR

It's the neck of a steel mill roll . . . and one of the toughest assignments in bearing protection. Scale is blasted off the red hot billets with cold water at 1800 psi. But specially designed C/R Oil Seals, with elements of Sirvene (synthetic rubber) never fail in their protection of the vital bearings. C/R won't fail you either, whether your sealing problem is big or little, simple or complex. Chicago Rawhide offers you unequalled oil seal development experience and facilities . . . and a large stock of available types and sizes. You can get acquainted with C/R by writing for your copy of "C/R Perfect Oil Seals."

C/R

PERFECT
Oil Seals

More automobiles, farm equipment and industrial machines rely on C/R Oil Seals than on any similar sealing device.

CHICAGO RAWHIDE MANUFACTURING COMPANY

1301 Elston Avenue OIL SEAL DIVISION Chicago 22, Illinois

IN CANADA: MANUFACTURED AND DISTRIBUTED BY SUPER OIL SEAL MFG. CO., LTD., HAMILTON, ONT.

Other **C/R** *products*

SIRVENE: (Synthetic rubber) diaphragms, boots, gaskets and similar parts for critical operating conditions • CONPOR: Controlled porosity mechanical leather packings and other sealing products • SIRVIS: Mechanical leather boots, gaskets, packings and related products.

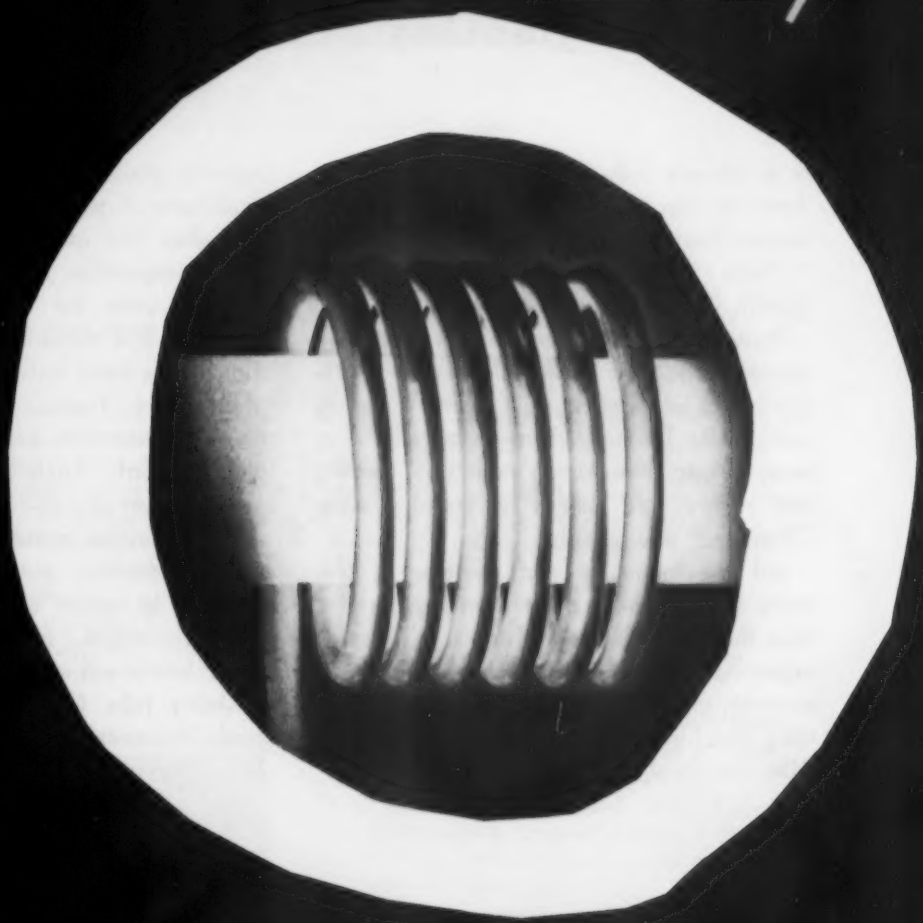
Melting

Heat Treating

Heating for Hot Forming

Joining

Core Baking



Induction Heating

Induction Heating

In a decade induction heating has grown from an electrical novelty to a shop-accepted heating means for mass production.

Those who have followed induction's growth still remember the early days.

Pioneering applications of high frequency power—especially in the field of heat treating—were gems of improvisation. Fixturing was in its infancy. Two-by-fours, baling wire, a box of assorted nails and screws, and a few odd pieces of transite were "standard" equipment.

But the ingenuity and courage of the early tinkerers was a lot more systematic than their primitive sets of tools. With each experimental part scrapped, they learned another, and more valuable lesson. In time, they combined their various engineering skills: electrical, mechanical, and metallurgical—to present American industry with a multitude of packaged, finished processes.

Today the combination of persistence and imagination has paid off. Induction heating units for melting, brazing, heat treating, and thousands of special applications have been installed in plants all over the country. Today's shop people no longer think of these units as a far-off-in-the-future development. Each unit has become an integral part of day-to-day production.

The question most often asked of the early induction pioneers was: "Will it work?" In recent years the question has been reworded. Now it is asked: "How much *better* will induction work?"

Doing jobs faster, cheaper, and with basic improvements in quality has made the big difference.

Section 1 ——▶ **Melting—P. 115**

Section 2 ——▶ **Heat Treating—P. 118**

Section 3 ——▶ **Heating For Hot Forming—P. 122**

Section 4 ——▶ **Joining—P. 126**

Section 5 ——▶ **Core Baking—P. 128**

ACKNOWLEDGMENT

The editors wish to thank the induction heating equipment makers of the Industrial Heating Equipment Association, and particularly its executive vice president, Carl L. Ipsen, for their cooperation in furnishing material for this feature.

Melting

Induction melting has an inherent and distinct advantage: the same electrical energy that melts the metal also stirs it. This makes for an ideal combination in an alloying furnace. Speed of melting is still another advantage. The energy is induced directly into the metal to be melted. Thus energy losses are minimized and melting rates speeded. The quick melting action of induction furnaces conserves metal. First, oxidizable constituents can be added at the end of the heat and still be completely alloyed. Then, too, exposure to the air is minimized even when such elements are present from the start of the melt.

Aluminum:

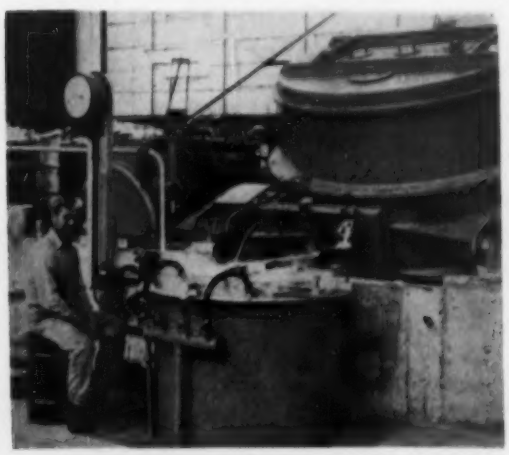
Induction furnace lends close conductivity wire.

◆ ALUMINUM is continuously cast in the form of ⅜ in. diam. rod which, in turn, is drawn to form a high-conductivity wire. Induction furnace equipment is used since continuous operation of the casting machine makes the conventional batch-type melting furnace inadequate.

The installation at the South Wire Company, Carrollton, Georgia, makes use of a 450 kw induction furnace with a melting compartment and a separate holding compartment. Aluminum is continuously melted and poured directly into a continuous casting and rolling machine.

Each compartment is provided with its own inductors and with separate temperature control means. The metal is discharged from the bottom of the holding compartment into the continuous casting machine over a heated spout.

Production is about 2000 lb/hr or about 500 tons of aluminum wire per month. Only two men are required to run the entire operation. A particular feature of the process is that it permits the production of wire coils of any size, thereby reducing welding costs.



Large holding furnace pours molten aluminum alloy directly into a continuous casting machine. Billets are later drawn into wire.

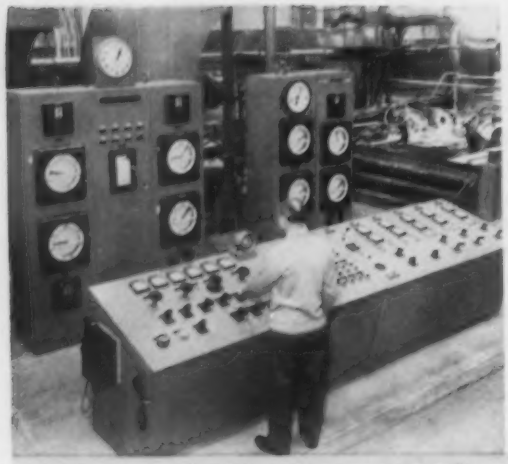
Strip Galvanizing:

Tama induction furnace lends close control to continuous strip process.

◆ In continuous galvanizing of steel strip, it was customary to use steel pots with fuel firing or electrical resistance heating for the galvanizing bath of molten zinc.

One possible limitation of such equipment can be the damage to the iron pot due to attack from the molten zinc. This is particularly true of zinc baths at high temperatures. The Tama induction furnace is provided with an inert refractory which is not subject to zinc attack. It has produced excellent results at the Wheeling Steel Company, Martins Ferry, Ohio.

Power input is practically unlimited, and the stirring action of the induction furnace keeps all of the ingredients in homegeneous mixture. Automatic temperature control of the induction furnace insures a close temperature range at all times. This feature is extremely important in



High speed galvanizing furnace, seen at the far right, can produce 18 tons of 36 in. galvanized strip hourly on continuous basis.

getting uniform and tightly adherent coatings.

A 1000 kw stationary galvanizing unit is shown in the above figure. Strip enters and leaves the molten bath in a vertical position. Guide rollers are used below the molten zinc level to guide the strip. The installation is capable of producing galvanized strip 36 in. wide at the rate of about 18 tons per hour. A tight coating between the sheet and zinc is obtained which is not affected by bending or other subsequent fabricating operations.

The use of a refractory to line the zinc bath does a lot more than simply eliminate the damaging corrosive action experienced with conventional iron melting pots. Because of its dielectric properties, it actually helps the efficiency of melting the metal in an electrical induction field.

Malleable Iron:

Submerged resistor-type electric furnaces produce uniform high quality.

◆ A low frequency submerged resistor-type electric furnace is now producing high quality malleable iron at minimum cost. Five such furnaces, rated at 550 v and 400 kw, are now producing about 150,000 lb of metal on a 24-hr, 6-day week basis. The installation is in operation at the I. F. Sales Company, Inc., New Philadelphia, Ohio.

Charging and melting losses are low and constant. Carbon loss never exceeds 0.2 pct and slag is held to a minimum. Each furnace holds 5000 lb of metal and is capable of melting and pouring 400 lb each 20 minutes.

Pouring is accomplished by means of a tap hole and plug. The furnace is not tilted. After each pour, the cover is removed and a new charge of 400 lb of scrap is added. This operation requires about 5 seconds. Then the cover is sand-sealed to prevent entry of air.

Average lining life is about three months, although one furnace poured nearly 2 million lb of metal before a new lining was required. Control is semi-automatic so that instruments indicate when a new lining is in order. Melting temperatures average about 2900°F.

Melting is uniformly constant in analysis and temperature, thanks to the inherent electromagnetic stirring of the charge and automatic temperature controllers.

This submerged resistor-type furnace, used for melting malleable iron, has a capacity of 5000 lb, produces 150,000 lb in 24 hours.

Magnets:

Several types of Alnico magnet alloys induction melted for accurate analyses.

◆ Almost all of the world's supply of Alnico permanent magnets are made in high frequency induction furnaces. One of the most recent and largest installations for this purpose was put into operation at the Carboloy Division of the General Electric Company, Edmore, Mich.

This plant adds about 500 lb per hour to the world's total capacity for these materials. Several types of Alnico alloys are melted. Analysis is almost always critical. When the element added is light or readily oxidized—such as aluminum—the problem is to so melt and stir the mixtures that the resultant alloy will meet the required analysis.

The high frequency furnace can melt its charge rapidly and also provide vigorous circulation. In melting Alnico 5 at Edmore, a charge of about 50 pct scrap of known analysis plus 50 pct virgin metal is made up. All of the charge except the aluminum and zirconium is brought up to about 2900°F.

Just before pouring, aluminum and zirconium are added and quickly stirred into the bath. Meanwhile bath temperature is being raised to the required pouring temperature of 3236°F. The process has to be fast or these metals will oxidize and spoil the analysis of the entire heat. For this reason, fast melting and careful control guarantee a consistently high quality melt with correct analysis.

High frequency furnace melts and pours Alnico magnet alloy. Pouring temperature is about 3236°F and melt control is very critical.

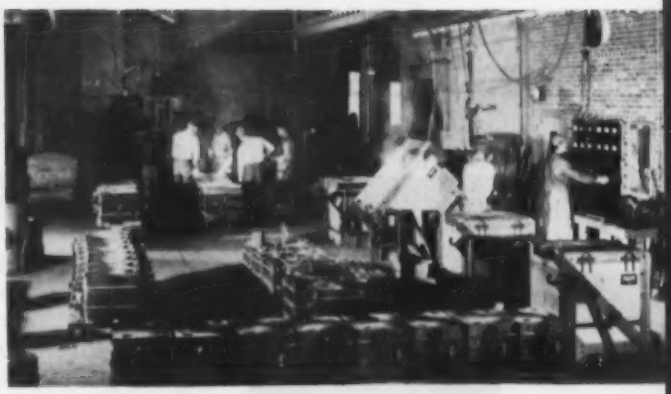
Alloy Castings:

New induction furnace equipment ups alloy foundry production.

◆ A leading producer of alloy steel valve parts and castings has been constantly expanding its production by the installation of additional induction equipment. Starting with a 20 kw high frequency converter type furnace back in 1939. Additional equipment of the induction type was added between 1946 and 1952.

At present the Alloy Steel Products Company of Bloomfield and Elizabeth, N. J., has a production capacity of about 1500 lb per hour or 12,000 lb per shift. Among the many products of the plants are stainless and alloy steel valve bonnets, bodies, gland plates and followers, discs, packing nuts, and trim parts.

The company's induction furnace equipment is said to have an output that far exceeds nominal furnace capacity because of the high speed of melting and good circulation of the molten charge.



High frequency converter-type and induction furnaces are used to produce stainless and alloy steel valves, gland plates, and trim.

Superalloys:

New superalloys now induction melted under vacuum for high purity.

◆ A variety of high purity alloys are now needed for atomic and jet engine applications. Until quite recently, interest in vacuum melted metals was largely academic. Now the swing is definitely in the opposite direction. Vacuum melting has become "big business."

Among the many companies now actively engaged in the production of vacuum melted materials are Carboloy Division of General Electric Company, Universal Cyclops Steel Co., Utica Drop Forge, and Vacuum Metals Co. The Universal Cyclops installation is typical in many respects. It is capable of melting six 1000 lb charges consecutively in the low micron range. These heats can be poured into ingots without breaking the vacuum seals.

A vacuum sealing charge port permits charges to be made up outside and lowered into the main tank under vacuum. As each heat is ready to pour, a turntable swings a mold into place. An arc applied to the molten metal in the mold insures a flat top ingot.

Vacuum melted metals claim to provide better mechanical properties than those generally obtained by air melting. Such properties as ductility and fatigue strength are claimed to have been markedly improved. Some of the improvement is associated with a lower inclusion count achieved through melting under vacuum.

For the most part, vacuum melted metals can be relied upon to show more consistent properties than those obtained by air melting. The absence of air and other impurities is largely responsible for the consistency obtained.

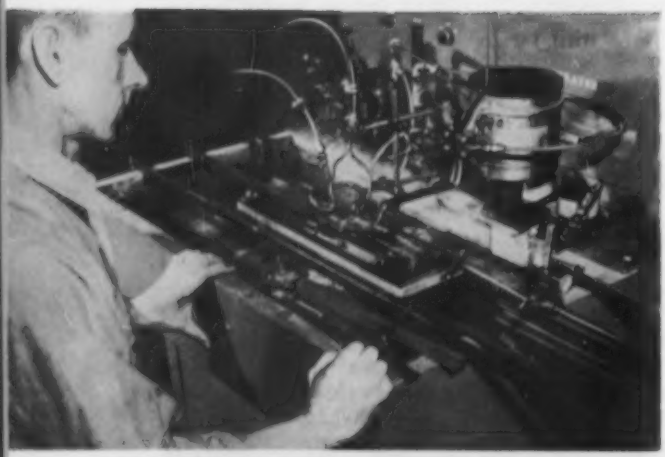
Although the bulk of vacuum melted alloys is presently intended for the more critical aircraft applications, the general field of vacuum melting is expected to rapidly expand to include more conventional materials.

Induction Heating

SECTION 2

Heat Treating

Induction heating provides the heat treater with a highly efficient means for selective heat treating. Where there is obviously no justification for heat treating the entire work piece, induction provides for the selective heat treatment of those surfaces where such treatment will do the most good. It also allows for different kinds of heat treatment on the same work piece. On a spur gear with an internal spline, for example, induction would permit the annealing of the spline section for broaching without interfering with the proper hardening of the external gear teeth. Look to induction for unusual versatility at relatively low per unit cost.



A 15-kw high frequency induction heater is used to selectively harden a rack bar. Original shape of the bar is preserved.

Eliminate Distortion:

Induction selectively hardens critical rack bar at lower cost.

◆ A RACK BAR is an essential operating component in the accumulating mechanism used on several adding and accounting machines. The rack must travel across the width of the machine at least 15 million times in a five-year period. Accurate operation of the machine depends a lot on whether the bar retains its hardness and original shape within strict limits.

Using a more conventional method for hardening these parts, Burroughs Corp., Detroit, was faced with expensive straightening operations to eliminate distortion. Induction heating solved the difficulty and, at the same time, resulted in cost reduction.

By applying selective induction heat, only those areas of the racks that require hardening are heated. Distortion is eliminated.

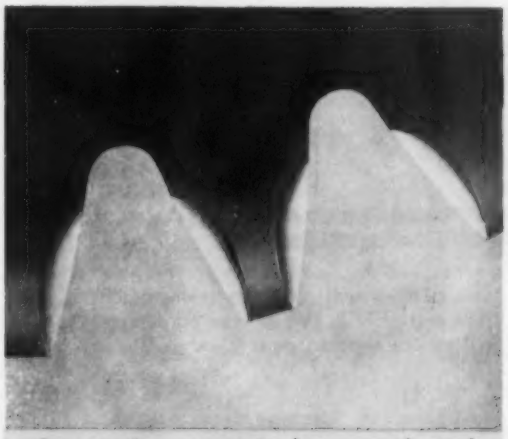
Longer Wear Life:

Tooth-by-tooth hardening of large gears improves wear, shock resistance.

◆ IMPROVED gears at a lower cost were the result of a switch from furnace to induction hardening. Equipment costs were held to a minimum by installing a fixture that can harden one tooth at a time. In this way, the New Britain Machine Company can heat treat finished gears up to 15 in. diam. with a 20 kw induction heater.

These gears were previously selectively carburized or through hardened. Protective copper plating was a "must." Resultant distortion required expensive grinding. Using a 20 kw induction heater, hardening is now confined to the tooth surfaces where wear is greatest.

Because of selective hardening by induction, distortion of the gears was eliminated.



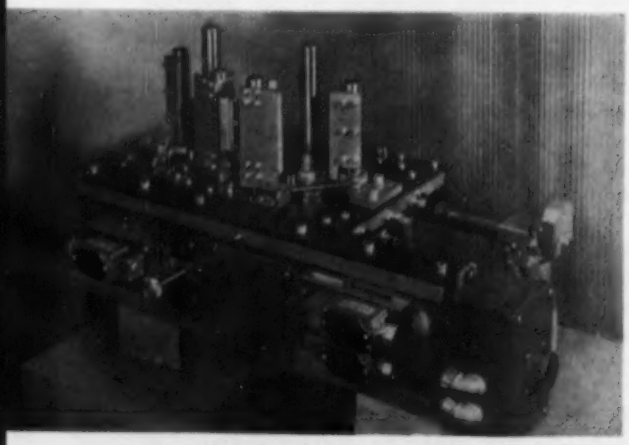
Gear teeth were previously case carburized or through hardened. Selective induction hardening has reduced distortion.

Clutch Hubs:

Induction unit speeds hardening of clutch hub teeth.

◆ A SPECIAL fixturing and indexing machine helped solve the problem of selectively induction hardening the faces on 8 and 12 tooth clutch hubs. This critical application, put into operation at Chrysler Corp., managed to confine heat treatment to the faces of the hub teeth without affecting other portions of the part.

Two loading positions were provided. Three clutch hubs of 8 or 12 teeth were placed on a loading shaft. A series of air cylinders were used to bring the three parts into the heating position. Two faces of the teeth on the three clutch hubs were heated and quenched simultaneously.



This special fixture holds and automatically indexes tooth clutch hubs for an automotive application. Hubs are selectively hardened.

The three hubs were then indexed to the next tooth until all of the hardening operations were completed. At this point, the clutch hubs were backed away from the heating position, and the second series of clutch hubs were brought into the heating position. In effect, this provided a two machine operation with one generator and one operator.

A 25 kw, ½ million cycle generator furnished the necessary power. A production rate of 190 pieces per hour was obtained. This produced a total of 1520 individually hardened sections per hour with the 8 tooth clutch and 2280 sections in the same time period with the 12 tooth clutch. Production rates of this magnitude greatly reduced per unit costs.

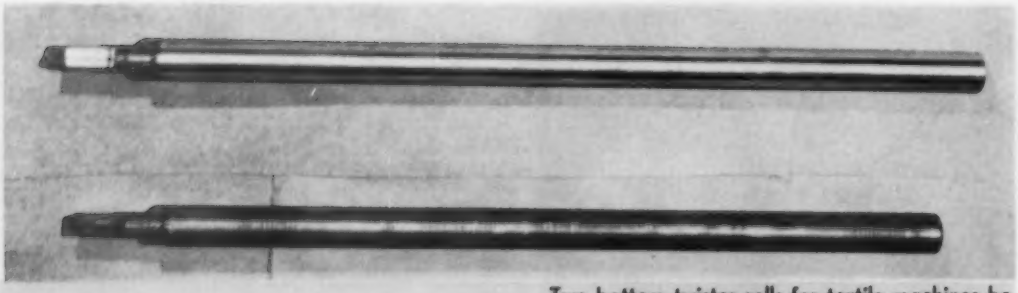
With the help of a relatively simple holding rig, this induction heater hardens the jaw surfaces of a wrench for longer wear life.

Tougher Wrench:

Wrenches last ten times longer as a result of induction hardening.

◆ INDUCTION hardening is producing wrenches and pliers that last ten times longer. These rather spectacular results are being obtained on tools made by the Utica Drop Forge and Tool Corp., Utica, New York.

Wrenches used for hard work over long periods of time have a tendency to wear or burr over the jaw surfaces. Once this happens, it is no longer possible to maintain a firm, flat hold on the work. Induction permits heat treating only those areas of the wrench that need to be extra-hard. This leaves the internal structure of the tool unchanged and preserves the desirable toughness needed to withstand stress and shock.



Two bottom twister rolls for textile machines before and after induction case hardening. Application was handled on a 50-kw unit.

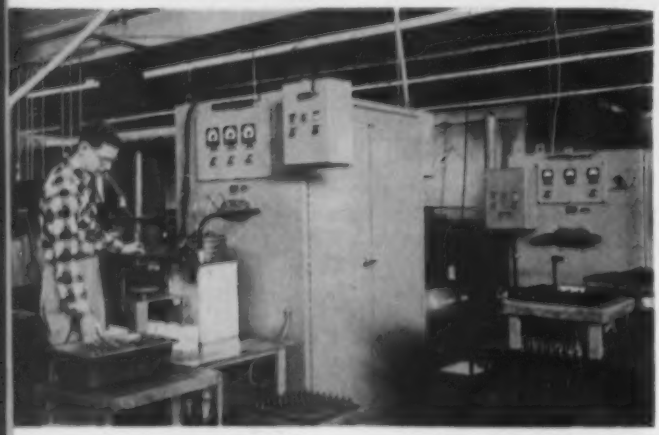
Textile Machines:

Induction used to heat treat variety of textile machinery components.

◆ INDUCTION heating is now being applied to hundreds of different size machine components for textile machinery. In the case of bottom twister rolls, production has jumped 1000 pct over that obtained by cyanide hardening at the Whitin Machine Works, Whitinsville, Mass.

All of the various induction applications are handled by one 50 kw and three 20 kw units. The induction heaters are used primarily for case hardening, but they are also used for annealing, silver soldering, and soft soldering.

Over 500 different machine components are now being hardened by the induction method. Even more parts will be added to the list as coils and tools are made for the different operations. The increased production rate is a major benefit, but uniform case hardness and high quality are of equal importance.



Operator is shown placing breech block slide for 20-mm aircraft gun in bench fixture prior to localized hardening with induction heater.

Gun Parts:

Induction heat treated parts meet rigid government specifications.

◆ RIGID government specifications on ordnance material demand a high degree of accuracy and uniformity. Aircraft guns, for example, have many working parts with close tolerances that require special treating and hardening to insure dependable performance. Induction heating is providing the consistency and top quality in ordnance products manufactured by Buffalo Arms, Inc., Akron, N. Y.

The company uses a 20 kw and 5 kw combination for hardening, brazing, and annealing component parts of aircraft guns. Hardening breech-block slides for the guns is one of the applications. These slides lock and unlock the action of the gun's breech before and after firing. Both ends of each breech-block slide receive localized hardening by the induction heaters.

One of the surfaces that is hardened is the upper nose or upper front-face surface which comes in contact with the push rods in the gun to unlock the breech mechanism. The other end receives localized hardening, which locks the breech mechanism preparatory to firing.

With the 20 kw heating unit, an operator can harden 100 breech-block slides on one end in an hour. After a quick change of coil fixtures, he can run the part through on the other end at the same rate of speed.

While these figures are quite impressive from the standpoint of heat treat production, the most significant results in the induction hardening operations are predominantly on the side of quality. The mechanized nature of the entire operation tends to further guarantee dependably consistent results.

Cast Iron Parts:

Careful control is keynote in heat treating cast iron.

◆ BEFORE the introduction of an induction heating unit, controlling the hardening of a wide variety of cast iron parts was a problem at the East Spartensburg, S. C. division of Draper Corp. Now a single 20 kw heater does the job of precision hardening over 40 different cast iron components.

One of the methods formerly used to harden these parts was the "chilled mold" process. With this process, a high percentage of the castings were rejected due to improper cooling and resultant embrittlement. Over-hardening frequently resulted from inadequate temperature control. This made drilling and tapping operations almost impossible.

Now with induction heating, the company is able to cast the same parts, drill and tap while the cast iron is soft, and then harden a selected area of the casting. The results are highly satisfactory quality-wise, and rejections have become a rarity. Variations in cooling rate are no longer a problem.

Over 40 different cast iron parts are induction hardened with the aid of simple holding fixtures. Cooling rates are highly consistent.

Mower Blades:

Heat treating blade edge without harming rivet holes solved.

◆ MOWING machine blades must be hard to hold their cutting edge and still tough enough to resist breakage. Selective hardening with induction produced the desired hardness on the cutting edge only. The rest of the blade remained soft so that it could be riveted to the cutter without stress and consequent breakage.

The substitution of induction hardening gave a higher blade quality. It also improved working conditions and increased production by 50 pct.

The operator loads the parts into a vertical magazine. A crank and crosshead mechanism delivers the parts individually from the bottom of the magazine into the inductor coil for heating. As each blade is pushed from the magazine into the coil, it forces the preceding blank from the coil into the quench tank.

The parts are hardened at a rate of about 3000 per hour. A conveyor removes heat treated parts from the quench tank for conveyorized delivery to and through a draw furnace.

For a relatively complicated heat treating problem, induction heating provides simplification with a high degree of reproducibility.

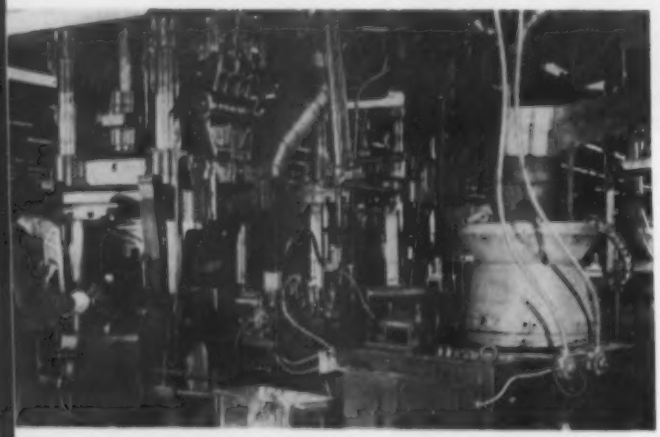
SECTION 3

Heating For Hot Forming

Induction heating offers several advantages particularly suitable to forging and forming operations. Rapid heating results in very low scale loss, therefore less metal loss and longer die life. Also, start up time is short and standby delays are at a minimum. Accurate repetitive control of temperature gives heating uniformity. Working conditions are improved through the absence of noise, heat and fumes. Its adaptability to mechanization permits automatic in-line processing to meet high production requirements.

Fuse Parts:

Continuous feed and automatic handling increase production of fuse parts.



ALUMINUM SLUGS for forging into fuse parts are heated on six 50 kw, single phase induction units. Production is 1100 pieces per hour.

◆ HEATING of 2½-in. diam x 1-in. thick aluminum slugs for forging into fuse parts is done with six 50 kw single phase induction units, each feeding an individual press. Production rate is 1100 pieces per hour.

The slugs are batch-loaded into a vibrating hopper and in turn fed down an inclined ramp to the entry end of the inductor coil. Air cylinders feed the column of slugs through the coil to a discharge chute from which they roll into the press.

Operation is controlled by a timer, and the actual temperature of each slug is automatically measured by a prod-type thermocouple. During start up or during changes in preset output rate, the thermocouple control automatically rejects any pieces that are not within the preset temperature range, by dropping them through a trap door discharge. Actual increase in production gained with this installation was 350 pieces per hour.

Bolt Head Forgings:

Stainless blanks heated uniformly. Die life increased up to 400 pct.

◆ NAVAL bronze, silicon bronze, copper, aluminum, Monel and all types of stainless steel are heated for forging at the H. M. Harper Co.

On 1-in. type 303 stainless hexhead machine bolt blanks, production was increased from 75 to 200 parts per hour with a 35 kw, 10 kc induction heater. The same machine is used on stock of ⅜ to 1¼ in. diam. Heated zones vary from ½ to 4 in. Automatic preset timing cycles provide complete uniformity of heating throughout both length and cross section, assuring a uniformily high quality product. Die life was increased up to 400 pct.

PRODUCTION of stainless bolts was increased from 75 to 200 parts per hour with this 35 kw, 10 kc induction heating machine.

Stainless Rod:

Rapidly heat small diameters for forging and upsetting.

◆ PARTS of 7½ to 9-in. lengths and ½-in. diam at the stem end of a previously upset stainless steel rod, are heated to 2200°F by RF induction for a second forging operation.

Magazine loaded, the pieces are positioned selectively into the inductor coil by an air cylinder operator. After the heating cycle the part is pushed back to the original position for discharge through a trap door, and ejection onto an inclined chute. All operations are automatic with the exception of magazine loading. Equipment is powered at 50 kw with a 450,000 cycle RF generator; production is at the rate of 240 pieces per hour.

The prior heating operation on the ½-in. diam rod for upsetting is done also with an RF power supply in a bank of three heaters each powered at 50 kw, heating a 3¾-in. end of the ½-in. diam stainless steel rod to 1950°F in 4 seconds.

Induction heating was used in both processes rapid uniform heating and for its in-line production use.

Drill Bits:

Higher production, longer die life in heating drill bit slugs.

◆ CALUMET and Hecla Consolidated Copper Co. uses one 75 kw, 10 kc machine for two purposes. Bars are first fed through the inductor coil and heated to 1450°F for cut-off into slugs at a rate of 36 in. per min. Slugs are then heated in the same machine to 1900°F for forging drill bits.

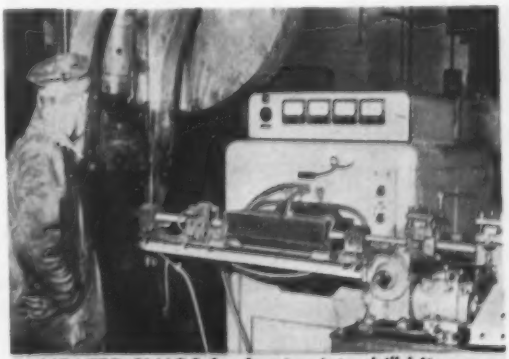
Heating cycles are preset assuring uniformity of results, and accurate forgings which need no subsequent machining. Heating is fast—one slug is ejected to the pressman every 6 seconds. There is little time for oxidation—hence no scale difficulties, longer die life.

Engineers at the Timken Roller Bearing Co., using induction for heating bar-stock for forging rock drill bits, report a reduction of scale from 2.79 pct to 0.79 pct, with production upped to 1500 pieces per hour.

Also in this field, induction heating has been put on wheels. The Joy Mfg. Co. decided to send "Mohammed to the mountain" in the form of the "Joy Mobile Shop."

Carrying a 20 kw, 10 kc induction heating machine powered by a Diesel-electric generator, it heats drill steels up to 2200°F for upsetting, then reheats the upset ends to 1500°F for normalizing prior to machining. This mobility is particularly desirable for field applications.

SECOND FORGING operation on stem end of upset stainless steel rod calls for induction heating parts to a temperature of 2200°F.



HEATED SLUGS for forging into drill bits are ejected to press operator at a rate of one every six seconds. Oxidation is minimized.

As shown by these examples, the ability of induction units to provide a rapid means of heating leaves little time for oxidation. As a result there are fewer difficulties incurred by scale formation on the surface of the part and die life is considerably increased.

Specialty Bolts:

Heating installation well-suited to job shop operation.

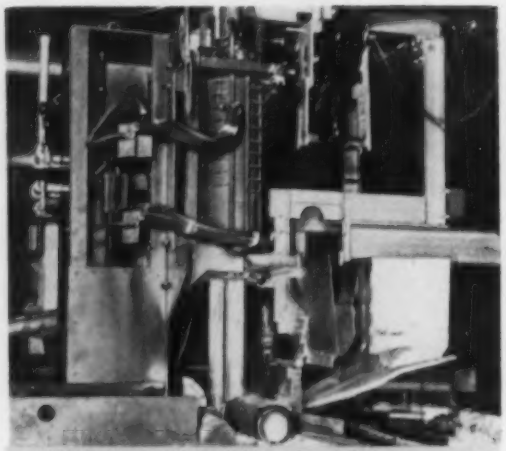
◆ IN A LARGE electrical manufacturer's plant forging for a variety of specialty bolts is done on a job shop basis to suit varied production requirements.

A fixed four-position induction heating station handles pieces ranging from ⅝ to 2-in. diam, and 1 3/16 to 3½ in. in heated length. Loading and unloading are done manually by the press operator. Heating time ranging from 25 to 90 seconds at 3 kc is terminated by a process timer.

This is a simple installation ideally suited for job shop operation. Similar installations of individual heating stations are widely employed, and may be nested in groups to meet production requirements, as dictated by floor area available.

A typical user experience with similar apparatus powered by a 50 kw, 10 kc, MG set, reports production on ½-in. diam stock zoomed from 500 to 1500 pieces per hour using this equipment. On ⅞-in. stock production rose from 250 to 600 pieces per hr. In both these cases induction heating has proven its ability to meet changing production requirements.

FOUR-STATION induction heating machine handles pieces ranging from ⅝ to 2 in. diam. Unit is well suited for job shop operations.



PIERCED stainless billets for tubing are reheated in this 400 kw induction heater to about 2300°F before extrusion operation.

Steel Extrusion:

Semi-portable unit readily adaptable to billet size charges.

◆ AN EASTERN manufacturer of stainless steel tubing uses a 400 kw induction heater for reheating 7 and 8-in. diam stainless steel billets for hot extrusion.

Material flow begins with the charging of cold billets into a rotary hearth furnace for the initial heat, followed by piercing, reheating from 1600°F to approximately 2300°F, and finally extruding.

The 400 kw induction heater operates on 2300 v, and includes an up-ending and hoisting mechanism with radiation type temperature control. Vertical construction was used to keep the billet weight off the coil and reduce liner wear.

The user found the unit sufficiently compact that it may be considered semi-portable. By supplying sources of power and water at two different locations, it is possible to move the unit from one point to another when the nature of the work requires that the heating cycles be altered.

The advantages of induction heating such as individual billet temperature control, immediate control of the heating cycle, and adaptability to the change of billet size are advantageous to the operation.

In another plant, 100-lb aluminum billets are heated for tube extrusion in a 400 kw three phase induction heater. Billets are automatically loaded into the inductor coil one at a time in less than two minutes. Flexibility of this heating setup reduces scheduling problems since billet sizes can be changed in a minimum amount of time.

Shells:

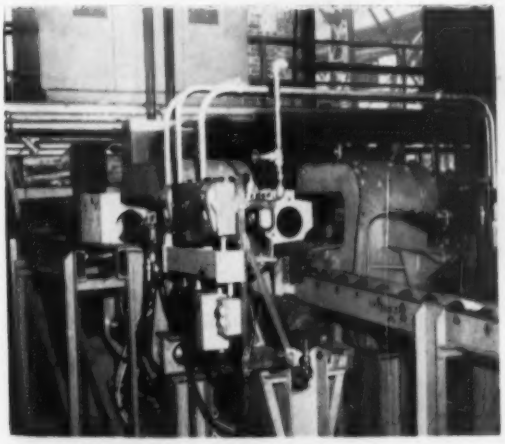
Parts heated automatically in production forging operation.

◆ AT THE Scranton Ordnance Plant induction heating equipment is used to heat the nose end of 8 in. and 155 mm artillery shells prior to forging.

Fourteen automatic dual hydraulic pusher stations on the manufacturing floor carry shell forms to the induction heating units. Conveyors on each side bring the shell forms to the two inductor coil positions. After heating, the shell forms are automatically discharged to a common conveyor between the pusher stations, for delivery to the nosing press.

Heating data on a typical 155 mm shell are 38 seconds at 200 kw, for a length of 9½ in. to 2175°F at the tip and tapering to 750°F at the end of the heated zone.

Automatic handling of the shells in and out of heating coils by conveyors with automatic stops, heat timing and coordinated press operation, makes this installation truly a production forging operation.



NOSE ENDS of artillery shells are heated on this equipment prior to forging. Conveyors carry parts to and from induction units.

Bars:

Seven-station machines provide extreme flexibility for press setups.

◆ MASSEY Harris, Racine, Wis., uses three induction heaters in an extremely versatile manner to feed hot billets for any given press setup. They are fed from a common bus to which three 500 kw, 3 kc MG sets supply the power. Each machine has seven heating positions. Any number up to seven of the heater stations in each bank may be used to supply hot billets at a high rate.

Billets of varying length and diameter may be fed through the heaters; or an end or selected mid-position of a long bar may be heated where only a portion of a single piece is to be heated.

One to seven different jobs may be set up at one time in each heater bank. Over a hundred different jobs may be set up in the time it takes to change the press dies for each. The separate jobs are card-indexed as to coil tap connection, power and feed setting for maximum efficiency.

The intermediate high frequency was considered optimum for all the bar sizes which range from 1-in. rounds to 4-in. squares. Each individual heater station is arranged in two sections, and each section is fully tapped for variable power, billet length, rate and type of feed. The heating cycle is controlled by preset timing, and the billets are ejected by mechanical pushers. The billets are manually loaded into individual ramp-type magazines.

Connecting Rods

Large-volume setup heats billets at 300 per hour rate.

◆ A LARGE automotive forge plant uses several unique mechanized induction heaters well-adapted to quantity production.

One machine shown contains the complete electrical equipment exclusive of the MG sets and control. It is used to heat connecting rod billets 1 7/16-in. RCS and 13½-in. long to 2300°F, at a rate of 300 per hour per machine. Three such machines are fed from a 1250 kw, 3 kc, MG set.

In operation the billets are loaded into the ramp type magazine, pushed sidewise on a timed cycle basis through the inductor coil, and discharged onto the takeaway conveyor.

By this type of construction and feed, floor area is saved, load factor is high, and temperature equalization is assured.

In the same forge plant the production of connecting rods required a bar end heater, to heat only the ends of 1-in. bars for an upsetting operation. The machine produces a heated bar every 6 seconds, operating from a 400 kw, 3 kc power supply.

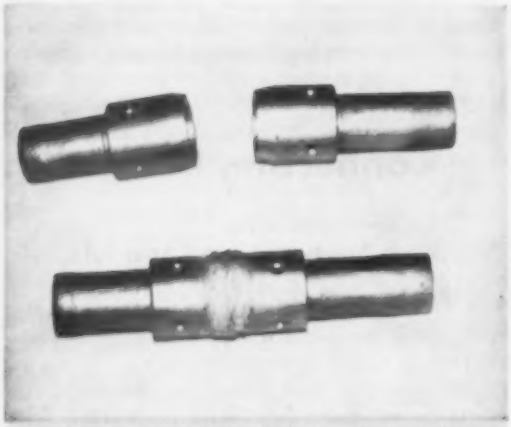
In this machine the bars are loaded into a magazine, then automatically pushed into a rectangular coil to the approximate heated length desired, then moved as a group sidewise across the coil. At the end of the heating cycle the last bar is then quickly ejected through the coil to a take-away platform.

Induction Heating

SECTION 4

Joining:

Induction welding, brazing and soldering offer to users a fast, clean, economical processing method. The high production rates and superior quality of products obtainable by these methods offset by a wide margin the high power requirements. Perhaps more important is the freedom from distortion — a factor which weighs heavily when processing precision assemblies. This, plus high product uniformity, lowers reject rates considerably. Processing speeds are high — in some cases several hundred percent higher than by previous methods.



JOINTS in track roller shafts, made by induction pressure welding, withstand extremely rugged conditions even in normal service.

INDUCTION heater brazes four refrigerator compressor housings simultaneously. With this setup, 580 joints can be brazed hourly.

Pressure Welding:

Shorter time cycles, less down time, speed shaft production.

• USING induction pressure welding, a large manufacturer of farm and road equipment has reduced costs on track roller shafts by a wide margin. By faster heating—55 seconds as opposed to 90 seconds by the previous method—production increased from 220 to 300 assemblies in an 8-hour shift. In addition to these benefits, welds are now more uniform and heating costs have dropped from $10.50 per hundred pieces to $1.95. Other savings result from drastically reduced down-time and maintenance expense.

Selective Heating:

Brazing of four assemblies simultaneously reduces unit cost.

• BRAZING by selective induction heating often results in improved product quality at lower production cost. An example is that of silver brazing fittings into refrigerator compressor housings. Using a 20-kw unit, four housings, each with two fittings, are brazed simultaneously in less than 50 seconds. Operating costs amount to less than 0.0025¢ per joint. In addition to increased production over former methods, there is less warpage, oxidation and scaling. Moreover, since there is less human element involved, rejects are fewer.

THIS 10-kw induction heating unit solders a ham can in four seconds. Not only is it fast, but the joint is clean and uniform.

Soldering:

Faster heating reduces time cycle on cans to 4 sec.

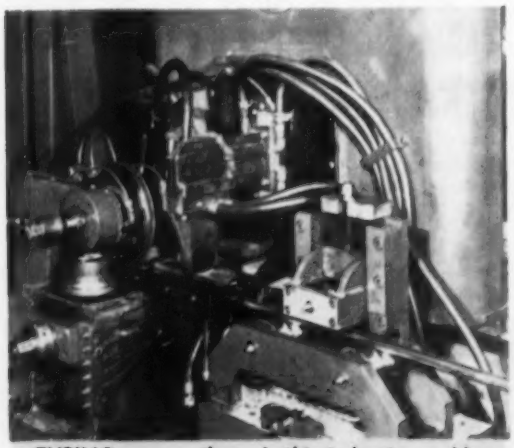
◆ THERE is no essential difference in induction heating parts for soft soldering and the methods used for brazing, annealing and hardening. However, the temperature requirements for soldering are only about half as high as those for brazing. Soldering by induction heating is clean, fast and economical. For example, using a 10-kw heating unit, cans for hams can be soldered and sealed in only four seconds.

Seam Welding:

Processing rates on pipe outruns pace of mechanical equipment.

◆ EXCEPTIONALLY high operating rates have been reached in pipe and tube mills using induction seam welding. One mill producing ½-in. to 2-in. diam tubing is operating at more than 250 fpm, and even this high rate is limited by the mechanical equipment in the line. In another installation, 8-in. diam pipe having a ¼-in. wall thickness is being welded at about one-tenth the cost of the method used previously. Still another installation operates at 300 ipm on 30-in. diam pipe having a wall thickness of ⅜ in., an increase of more than 250 pct in welding speed over the method formerly used. In addition to welding ferrous pipe and tubing, a number of mills produce aluminum tubing. One mill welds 1-in. diam aluminum tubing at 200 fpm and on 3-in. tubing the speed exceeds 100 fpm. Stainless steel and brass tubing have also been welded on the same installation.

▲



TUBING passes through this induction welding mill as speeds up to 250 fpm. Welds are continuous and uniform.

Brazing:

Lower reject rates stem from minimized warpage, uniformity.

◆ INDUCTION brazing offers several advantages to aircraft manufacturers, but the one which probably holds greatest importance is reduced warpage. In several cases, rejects are 80 pct lower than with previous methods. Silver brazing of such parts as piston rods and clevis assemblies, hydraulic cylinders, connecting rods and tubing has been speeded substantially. In brazing shrouds to the tips of compressor blades for turbojet engines, the brazes have a high degree of uniformity and their average pull test loading is 33 pct above the minimum requirements.

Induction Heating

SECTION 5

Core Baking:

Keen competition in the foundry business leaves little leeway for techniques involving trial and error. In recent years, many foundrymen have gained an advantage by resorting to dielectric equipment for core drying. Rejects, once a source of major loss, are now down to negligible levels. Drying times, which previously required hours, are now down to minutes.

SAND CORES for railroad car wheels dry in an average time of 8½ minutes—without burning—as they pass through dielectric heater.

MORE THAN 850 lb of cores for critical castings are dried each hour by this 15-kw unit. About 99 pct pass rigid inspection requirements.

Rail Car Wheels:

Electronic unit reduces handling — and breakage.

◆ ELECTRONIC drying of cores for railroad car wheels has improved quality, reduced handling and improved working conditions generally in the foundry of a large eastern manufacturer. The electronic unit processes an average of 600 lb of sand cores hourly. In the green state, the cores have a moisture content above 3.5 pct. Cores are placed directly on a conveyor and carried through the drying unit without any intermediate handling, thus reducing the possibility of damage to the fragile green cores. Curing time is 8½ minutes.

Precision Castings:

Electronic baking drops reject rate sharply.

◆ SEVERAL factors were responsible for United Foundries, Inc., Wyoming, Pa., to install a 15-kw electronic core baking unit. Probably the most important of these was the high degree of uniformity and low number of rejects among the cores produced. Formerly, on critical castings, the rejection rate ranged from 10 to 40 pct. Now, using an electronic unit, 99 pct of all cores pass highly critical inspection. In addition, the production rate on cores containing 3 pct moisture has been raised to 850 lb per hour.

Want Extra Copies? **A limited number of copies of this feature issue will be available upon request to Readers' Service Dept., The Iron Age, Chestnut & 56th Sts., Philadelphia 39, Pa.**

From the collection of Lewis Winant, New Jersey Arms Collectors Club. Maker: Le Conte, Paris, France, 1758-1763. An 11-by-14 inch print of this illustration with part and lettering omitted is available free on request on company letterhead.

In producing this cam of sintered iron powder, Bound Brook competed directly with other forms of metal fabrication — and emerged victorious. Bound Brook's knowledge and experience with powder metallurgy combined the plus values of uniform density, consistent dimensional accuracy, good surface finish and high speed production to create a superior part at moderate cost. Whenever you are challenged with a metal-fabrication problem which is not easily solved by conventional metal-working methods why not call in your Bound Brook Man? There's no obligation for inquiring—and, in conjunction with your engineers, he could produce a winner!

9

BOUND BROOK

BOUND BROOK OIL-LESS BEARING CO., EST. 1883, BOUND BROOK, N. J.

Pioneer in

POWDER METALLURGY BEARINGS + PARTS

For longer abrasive life you want...

TRU-STEEL lasts longer than ordinary steel shot. It *should* last longer because it's not only heat-treated, but drawn to exacting tolerances. Tru-Steel saves on machine parts, too, because it will not break down into fines that cause wear . . . *controlled chemistry, plus painstaking control checks give Tru-Steel the right hardness for fast, thorough cleaning.*

All this adds up to reduced maintenance and lower blast cleaning costs. But that's not all. You'll find that in sizes most popular for blast cleaning, Tru-Steel's original purchase price is lower than any other steel shot of comparable analysis and heat treatment! So you not only save money at the time of purchase but in use also.

Find out what Tru-Steel can do for you. Sold and recommended by Pangborn Corp., Hagerstown, Maryland.

STEEL SHOT PRODUCERS, INC.
BUTLER, PA.
Subsidiary of Pittsburgh Crushed Steel Co., Pittsburgh, Pa.

ATOMICS: New Research Lab

"Hot cell" laboratory recently completed is largest yet without federal funds . . . Three more units are planned for industrial research.

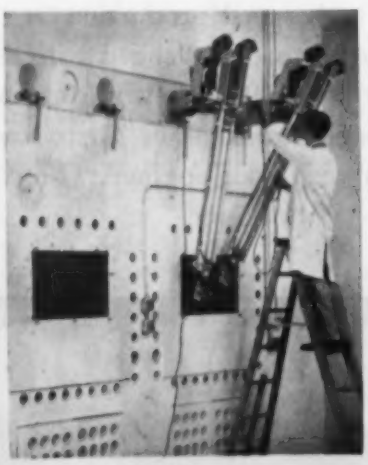
First of three major units in Battelle Institute's new atomic energy research center has recently been completed at Columbus, O. The "hot cell" laboratory is the largest yet to be built without federal funds. When all units are completed, Battelle's atomic energy research center will provide $3.5 million worth of facilities available to both industry and government for atomic energy research.

A power reactor development (critical assembly) laboratory is scheduled for completion later this year. It is designed specifically for use by industry in development of commercial power-generating plants.

Swimming-pool Type

Third unit will be a swimming-pool-type research reactor. This reactor is scheduled to "go critical" in the spring of 1956. It is designed to operate at 1000 kilowatts on Uranium-235 fuel. The installation will make possible extension of research in the metals, machinery, ceramics, electronics, and allied industries. One important use will be in connection with the development of nuclear plants for the generation of electricity.

The recently completed hot-cell laboratory has been designed and engineered for safe handling of large quantities of highly radioactive materials. Studies will be made on the effects of radiation on materials used in nuclear reactors, and on the handling and processing of nuclear fuels and other radioactive materials.



Hot cell laboratory . . .

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 161. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Metallurgy:

Economical process upgrades hematite to magnetite.

Premium-grade feed for the nation's blast furnaces can now be produced economically from formerly useless ores. Low-grade hematite ores are converted into magnetite by a "fluidizing" process. The magnetite then is refined by magnetic separation.

Most low-grade ores are amenable to the process. In many cases recovery of the iron is over 90 per cent.

The fluidizing process is carried out at high temperature. It consists of rapidly bubbling a gas up through a bed of finely-ground

hematite ore. The gas takes away some of the oxygen of the ore, reducing it to magnetite.

The process is continuous, virtually automatic and can handle large quantities of ore. Operation is unusually flexible and can be controlled to give a uniform high-quality product. Test work was carried out with producer gas from bituminous coal.

Operating Costs

The ore flows by gravity through the system, overflowing from one compartment to the next much like water. No 'slippage' or 'hang ups' occur to upset operating conditions.

Estimated operating cost is 63¢ for processing one long ton of feed with natural gas. Cost is 71¢ using producer gas. Estimates are based on use of a fluidizing unit 22 ft in diam and 70 ft high.

Extends Ore Reserves

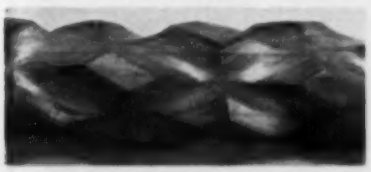
Next step in the development of the system is installation of a prototype unit in cooperation with an iron ore producer. The process may be expected to help extend our domestic ore reserve by upgrading the now-worthless taconites.

Details of the process were presented at a recent American Chemical Society meeting by R. J. Priestley, Dorr-Oliver, Inc., Stamford, Conn.

Drawing:

New threaded wire process cuts drawing costs.

A new wire drawing process permits drawing a wide range of threaded wires on conventional, continuous wire drawing machines. Speeds up to 700 ft



Easily drawn shapes . . .

POWDER METALLURGY BEARINGS + PARTS

AIR LIFT

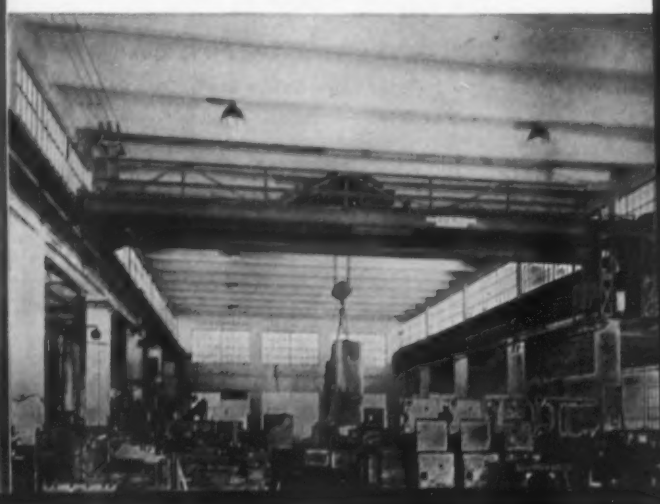
for heavy materials

Crowded isles and sluggish flow of materials cost you money. So why not go over the top! You can speed production, cut your costs with Conco Cranes, custom designed for your specific needs. Let us show you how. Write for a trained Conco engineer to call and make recommendations, or request bulletin 3000A covering our complete Conco line. Conco Cranes are backed by 37 years of experience.

CONCO ENGINEERING WORKS
Division of H. D. CONKEY & COMPANY
15 Grove Street, Mendota, Illinois

CRANES HOISTS CONCO

AFFILIATES
CONCO ENGINEERING WORKS—Domestic Heating Equipment
CONCO BUILDING PRODUCTS, INC.—Brick, Tile, Stone



Phffft...and it's painted!

DeVilbiss automatic spray machine ups painting production. Example: finishing 3¼" O.D. flower pots up to 3600 an hour.

Just load your product or part on a high-speed DeVilbiss spray machine, and *phffft* . . . it's painted — automatically! And with the highest degree of uniformity! Split-second timing, accurate gun positioning, and synchronized conveyor speeds prevent streaks, sags, and wasteful overspray. You actually *save* materials, as you produce consistently better finishes in a fraction of the time consumed by manual methods.

Know in advance the savings of automatic painting

DeVilbiss offers automatic spray machines for painting products of practically any size or shape, and for use with most conveyor systems. To have us run a test on your product and report savings *before you invest a cent* — send us full data about your product, coating applied, number of coats, and production rate desired.

THE DEVILBISS COMPANY, Dept. 331, Toledo 1, Ohio

Santa Clara, Calif. • Barrie, Ontario • London, England

Branch Offices in Principal Cities

FOR BETTER SERVICE, BUY

DEVILBISS

With spindles six inches apart, chain-on-edge conveyor moves unpainted pot in position.

At precise instant, two guns spray with overlapping patterns as pot revolves three times.

Painting takes one half second. If spindle is empty, machine skips it; guns don't spray.

Finished pot moves as next one automatically takes position. Total cycle lasts one second.

"Can be drawn in spiral form including squares, triangles and ovals . . ."

per minute are practicable. Only a simple, inexpensive attachment is required. The process is applicable to high carbon and mild steels.

Complex Sections

Variously shaped wires can be drawn in spiral form including squares, triangles and ovals. A helix angle up to approximately 30° off the longitudinal is possible. Complex sections with continually varying shapes and cross-sectional areas throughout the length of the wire also are being produced for special applications.

Bulk of present production is going into threaded nails, according to the Canadian manufacturer, The Steel Company of Canada, Ltd., Hamilton, Ont.

Reduced weight is possible because of the nails' increased holding power. Stiffness is increased in the nail shank by use of 1035 steel.

Handling:

High alloy conveyor belt moves castings through furnace.

A 105 ft high alloy steel belt moves castings forty-odd feet through a heat treating furnace at the Tractor Works of International Harvester Company, Chicago. Temperatures range up to 1550°F.

Center to center distance of shafts is 48 ft 3½ in. Pitch of belt is 3 in. and width 4 ft 3⅜ in.

High alloy belt . . .

Extreme length of the belt places high stresses on the links when it is loaded. Thus a combination of driven rollers and idler drums is employed. This system also provides uniform motion of the conveyer through the furnace. Conventionally, the entire weight of the belt and its load is pulled from the head end.

HT Alloy Used

The belt is type HT (35 pct Ni, 15 pct Cr) cast high alloy. This alloy was selected by the supplier, Holcroft and Company, for its good creep strength at high temperatures. Rollers and idler drums also are HT alloy.

After going through the furnace, the belt is returned on refractory skids.

Fabricating:

Jigs, templates, fixtures of reinforced fiberglass.

Dimensional stability and light weight of reinforced fiberglass is encouraging its use in fixtures, jigs and templates. Industrial grades can be formed easily into special shapes. Strength, flexibility, color and acid resistance are variable to meet individual needs. It is lightweight, even in large sheet size and thicknesses up to 1½ in.

Atlantic Manufacturing Company, Philadelphia, is successfully using the material in drill jigs. It was developed by Strickland Plastics Company, Long Island City, N. Y.

High Strength

A typical reinforced fiberglass has a flexural strength of 37,000 psi, compressive strength (edgewise) of 35,200 psi, shear strength of 8200 psi on a double shear, and tensile strength of 27,700 psi.

Normally a fire-resistant material, it also is available in a self-extinguishing grade. The electrical grade has a low power factor, typically 0.03 at 60 cycles or 0.01 at 1 megacycle. Its insulating value is at least equal to that of most woods, since it transmits only 1.7 Btu/in./°F/sq ft/hr. The material is corrosion-free and easily cleaned.

Want more air for your money?

Check valve *on DeVilbiss compressor outfits securely seals air in tank. Manifold is finned for additional after-cooling; provides mounting for pressure switch, eliminating piping and additional tank openings.*

If you're losing on power, upkeep and depreciation, then it will pay you to replace your old air compressor with a new DeVilbiss outfit. By actual tests, you'll get as much as 22.6% more air per power dollar. DeVilbiss efficiency means high *actual delivery.*

In addition to check valves, every DeVilbiss compressor includes: A.S.M.E. approved tank, automatic pressure switch, diamond-bored pistons, cylinder head with removable valves, quality electric motor or gas engine.

Contact your local DeVilbiss jobber for help in analyzing your compressed air problems.

THE DEVILBISS COMPANY
Toledo, Ohio
Santa Clara, Calif. • Barrie, Ontario
London, England
Branch Offices in Principal Cities

FOR BETTER SERVICE, BUY
DEVILBISS

Mighty handy piece of materials handling equipment is this Towmotor Fork Lift Truck which high-stacks 3300-pound loads of sheet metal for a prominent steel fabricator — increasing storage capacity 70%.

the HIGH and the MIGHTY...

There are many steps required to turn raw materials into finished products and Towmotor Fork Lift Trucks are at home in receiving, processing, assembly, storage, or shipping jobs. By *Mass Handling* materials, Towmotor speeds production and distribution, cuts storage costs, strengthens *every link* in your chain of operations. For Certified Job Studies covering savings in your particular industry, write TOWMOTOR CORPORATION, Div. 1511, 1226 E. 152nd St., Cleveland 10, Ohio.

TOWMOTOR
THE ONE-MAN GANG

FORK LIFT TRUCKS
and TRACTORS
SINCE 1919

TOWMOTORS are made only by TOWMOTOR CORPORATION

Welding:

Double-wall steel casing for underwater tunnel.

More than a mile of double-shell steel casing is being fabricated on a production line basis by Baldwin-Lima-Hamilton Corp., Philadelphia. The casings (total weight 50,600 tons) are for use in building a $19 million vehicular tunnel under Hampton Roads, Va.

Specifications call for 6900 ft of twin-wall casing in 23 sections, each 300 ft long. The outer, octagonal-shaped wall of each section is 37 ft across flats. The inner circular wall is 33 ft diam.

Floated to Site

Special press dies and welding fixtures were constructed to form the steel plate and hold it in position for welding. Fifteen foot sub-sections of the tube are weld fabricated in the shop. Then they are transported to the launching site on specially built cradles. The sub-sections in their cradles are butted into a 300 ft launching tube, and welded into a continuous structure.

After fabrication, the casings are sealed and launched into the nearby Delaware River. Concrete is used to ballast the sections on their trip to Hampton Roads.

Twin-wall tunnel . . .

GENERAL REFRACTORIES

. . . and all the fixin's—thanks to BRICK

On the table at last, after hours of tantalizing fragrances wafting from the kitchen. Another mission completed by brick.

Brick built the ships and trains and trucks that brought the "makin's". Refractory brick. It created the steel for the stove and the carving knife . . . the heat for the oven. For everything that's made or moved owes its existence to the refractory brick which contain the flames of industry.

Making these refractories is an exacting science. When you deal with temperatures of thousands of degrees, you can't afford to guess. So General Refractories operates the world's largest and most modern refractories research laboratory, constantly seeking progress and perfection.

With plants and facilities strategically located throughout the country, General Refractories provides industry with a complete refractories service dependably . . . economically . . . everywhere.

GENERAL REFRACTORIES COMPANY
Philadelphia 2

A COMPLETE REFRACTORIES SERVICE FOR THE STEEL INDUSTRY

OLIVE HILL BF and OLIVE HILL HI-FIRED brick rank high in any list of prominent and widely used brands of blast furnace refractories. Manufactured from dense-burning Kentucky flint fire clays by Grefco's unique manufacturing processes, OLIVE HILL brick set a standard for blast furnace refractory quality and workmanship.

Grefco processing of OLIVE HILL brick entails:

1. Careful selection, testing, stockpiling and blending of fire clays to insure uniform raw material quality.
2. Grinding and screening to prescribed formula to promote high density of product.
3. Efficient dearing during brick forming, also to promote density and proper physical structure.
4. Careful firing to exacting temperature schedules to yield uniform high quality brick.
5. Close inspection of final product with gauging and sorting of brick to close size tolerance.
6. Quality control by statistical analysis procedures for the manufacturing processes.

In service, OLIVE HILL blast furnace brick, both BF and HI-FIRED, have produced many splendid performance records in the past. OLIVE HILL linings in presently operating furnaces, are giving outstanding performance and are more than meeting the increasing requirements of the expanding American Iron and Steel Industry.

CM Lodestar®

ENTIRELY NEW
differently NEW

FLEXIBLE LINK CHAIN

PUSH-BUTTON CONTROL

FEATURING:

- Push Button Control
- Self-Adjusting Heavy Duty Brake
- Sealed-in Lifetime Lubrication
- Overload Protection
- Full Enclosed Components
- Lowest Headroom
- "CM-Alloy" Flexible Link Chain

CAPACITIES: from ½ to 1 ton. Single and 3 phase. ¼ ton model weighs only 51 pounds.

$149.50 and up

Built to serve you without costly maintenance

Lodestar is the first truly "heavy duty" version of the small electric hoist. The CM Lodestar is designed to operate without costly maintenance or interruptions in your work schedules. The initial cost is practically your only cost with a Lodestar... an extremely low cost indeed!

WRITE US or call your CM distributor for literature, prices and quick delivery from stock.

CHISHOLM-MOORE HOIST DIVISION
Columbus McKinnon Chain Corporation
Tonawanda, New York
REGIONAL OFFICES: NEW YORK • CHICAGO • CLEVELAND
In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ontario

CM HOISTS AND CHAIN

Steelmaking:

German vacuum process degasses steel.

Flaking of ingots and metallurgical failures of forgings in service may be reduced by a steel degassing process just made available in this country.

National Research Corp., Cambridge, Mass., has concluded a licensing agreement covering a degassing process developed by Bochumer Verein AG of Bochum, West Germany.

Special Vacuum Chamber

Ordinary molten steel from an open hearth or an electric furnace is degassed. It is poured through a special sealing device into an ingot mold or ladle. The mold is surrounded by a chamber at less than 1/1000 atmospheric pressure, maintained by a high-speed vacuum pumping system.

German degassing unit . . .

As the stream of metal enters the vacuum chamber it is violently dispersed. Dissolved gases are evolved from the metal and pumped away. This results in an ingot or ladle of steel with greatly lowered gas content.

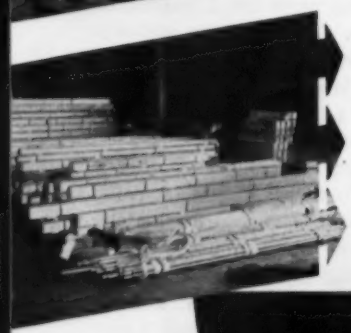
Hydrogen content is significantly lowered, of importance to the steel maker troubled by flaking of large ingots due to high hydrogen content. Manufacturers and users of large forgings also may benefit, for serious service

Why USE OUTMODED EQUIPMENT AND SYSTEMS TO STORE BAR STOCK?

Inefficient bar stock storage equipment and systems add to your production costs, invariably increase the price of your product, often make stock handling unsafe for employees.

When YOU CAN DO IT SO ECONOMICALLY, EFFICIENTLY AND SAFELY *with* PS PORTABLE *Heavy Duty* BAR RACKS

Stock storage and selection using automatic tongs suspended from overhead cranes are neatly and efficiently performed.



Why not use modern, cost-reducing PALMER-SHILE portable heavy duty BAR RACKS with superior design features that enable you to tier and store with such ease and safety? Racks are engineered to save you valuable floor space and make stock handling and selection so simple.

Check these advantages against your present equipment and system then decide on Palmer-Shile bar racks for *your* plant:

1. Channels at the bottom of the rack have cold formed upset slots in them that make possible wrap around crane bars for flush rack bottom, insuring sturdy, rigid, safe tiering—rack upon rack.

2. Heavy gauge steel safety stacking pockets on rack corners eliminate danger of rack slipping or falling.

3. Double thickness lifting lugs welded to wrap around channels, for maximum strength and safety.

Let our engineers explain to you why these and other design features make Palmer-Shile racks a good investment in more efficient handling of bar and other stock. Racks are engineered-built to your specifications for any size load and capacity.

Stock checking is no problem at all in this storage area with its tiers of Palmer-Shile Bar Racks.

Modern stock storage in sturdy portable heavy duty Palmer-Shile racks saves floor space and permits storage of more stock tonnage.

DESIGNED AND MANUFACTURED BY

Palmer-Shile Co.

16005 Fullerton Avenue, DETROIT 27, MICHIGAN

126 Dartmouth St., BOSTON 16, Mass., COmmonwealth 6-0570 • 1209 Burlingame Ave., BURLINGAME, Calif., Diamond 2-0823 • 612 N. Michigan Ave., CHICAGO 11, ILL., Michigan 2-7407 • 857 Leader Bldg., CLEVELAND 14, Ohio, SUperior 1-3235 • 3301 Walnut St., DENVER 5, Colo., ALpine 5-3984 • 202 Genesee Bank Bldg., FLINT, Michigan, CEdar 8-6881 • 4301 Allerton Blvd., FORT WAYNE, Indiana, EAstbrook 2816 • 835 No. Capitol Ave., INDIANAPOLIS 4, Indiana, MElrose 5-2587 • 6440 Fleet St., LOS ANGELES 22, Calif., RAymond 3-3733 • 5107 Columbia Ave., ST. LOUIS 9, Mo., PRospect 1-1474 • 199 Main St., WHITE PLAINS, N. Y., White Plains 6-1354.

Another of the Reasons Behind Brad Foote Quality—

DEBURRING

• Deburring of gears isn't normally included in specs or drawings. And we don't get paid for it. But here at BRAD FOOTE we take pains and expend many man hours on deburring—for we know that one tiny burr can ruin a $100,000 machine.

• Examine your next shipment of gears. See whether your present supplier is painstakingly removing all the burrs. Find out how many hours your assembly department has had to charge against deburring. See another way in which BRAD FOOTE quality and extra attention to details saves you money.

• Prove to yourself the savings that BRAD FOOTE quality can mean. Let us quote on the gear requirements for your next program—whether it be radar equipment, diesel engines, etc. BRAD FOOTE has experience in providing gears for almost every specialized application and would welcome the opportunity of discussing your gear problems.

BRAD FOOTE MAKES ALL TYPES OF GEARS—
IN A COMPLETE RANGE OF STYLES AND SIZES

BRAD FOOTE GEAR WORKS, INC.

1309 South Cicero Avenue • Cicero 50, Illinois
Bishop 2-1070 • OLympic 2-7700 • TWX CIC-2856-U

subsidiaries | AMERICAN GEAR & MFG. CO. Lemont, Illinois Phone Lemont 920 | PITTSBURGH GEAR COMPANY Phone SPalding 1-4600 Pittsburgh 25, Penn.

Ruthman GUSHER coolant pumps

Illustrated
Stanat Model TA - 624
Combination Rolling Mill
equipped with a Ruthman
Gusher Coolant Pump.

Each Gusher Coolant Pump is precision built — a credit to the metal working machines in which they are installed. The dynamically balanced rotating assembly cuts vibration and wear to a minimum. Pre-lubricated ball-bearings require no further attention. There is no priming or packing necessary. Your Gusher Coolant Pump is a highly efficient precision machine.

Precision Built
FOR EFFICIENT OPERATION

Model 11022

THE RUTHMAN MACHINERY CO.

1809-1823 Reading Road — Cincinnati 2, Ohio

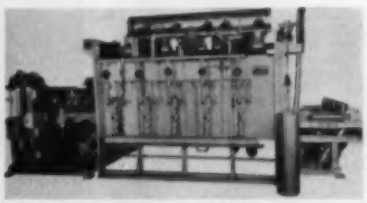
metallurgical failures have been attributed to high hydrogen content in such materials.

Forging:

Blanks automatically loaded in seconds.

Narrow entrance and exit openings on a Kozma forge furnace is responsible for a new automatic loading design. The handling mechanism moves with varying velocity. In operation, a part is slowly lifted, quickly moved, then slowly and gently deposited.

The usual walking beam loader rotates at a constant velocity so that it picks up the workpieces and drops them at the same speed that it carries them.



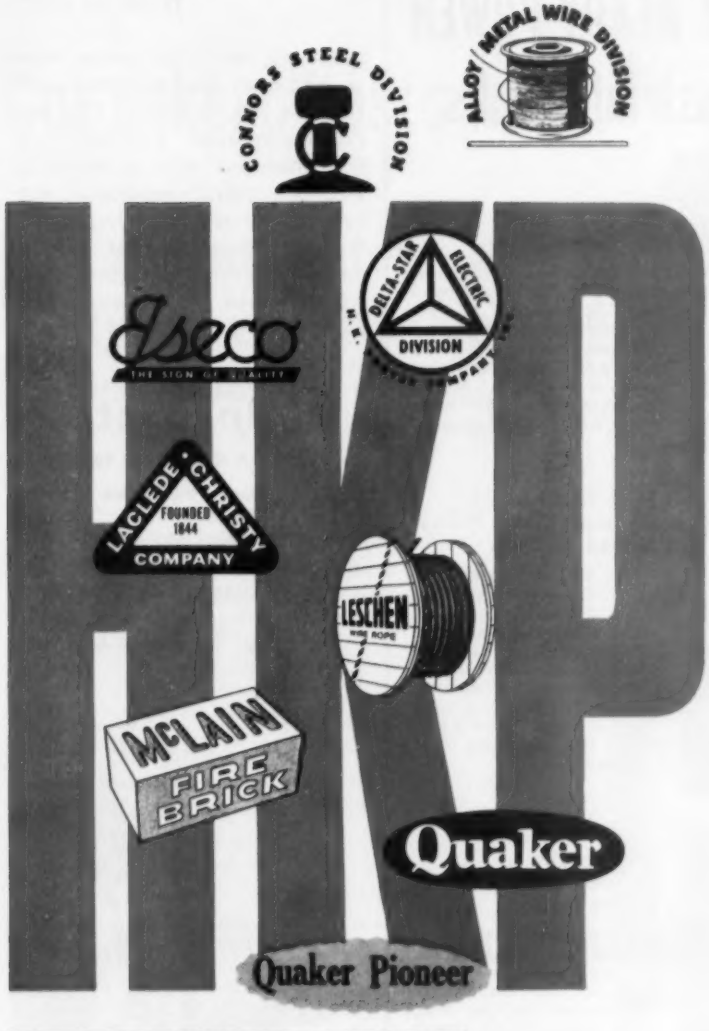
Automatic loader . . .

In the new design developed by Hautau Engineering Co., Ferndale, Mich., the walking beam mechanism lifts the part just enough to clear the supports. Motion is accomplished through a combination of harmonics expressed on large crankshafts. These crankshafts, powered by large gear reducers, are driven by motors through electric clutches.

Lifted to Furnace

Incoming parts are deposited on two rails. The stack is automatically shuttled to an elevator which rises intermittently to maintain a constant stack height. Two cutoff bars separate the top blank from the stack and slide it onto the furnace's stationary rails. The walking beam picks up the blank from here and carries it step by step through the furnace. At the furnace exit a similar mechanism unloads through a distance of 40 in. to a pressing operation in only one second.

The walking beam rails in the furnace are designed to eliminate



For further information about any Division or the parent company, write Dept. 113,
H. K. PORTER COMPANY, *INC.*
300 Park Ave., N. Y. 22, N.Y.

RIVERSIDE

VULCAN CRUCIBLE STEEL CO. FINE TOOL STEELS

W-S HYDRAULIC
ESTABLISHED 1848

W-S

ALLOY METAL WIRE, Prospect Park, Pa., a leading manufacturer of wire, rod and strip, in stainless steels, nickel alloys, resistance alloys, and specially formed wire shapes. Development engineers assist in drawing specifications to meet fabrication needs.

CONNORS STEEL, Birmingham, Ala., supplies the industrial South and Southwest with concrete reinforcing bars, merchant bars, structural angles, bulb tees, hot rolled strip, steel fence posts, and highway sign posts.

DELTA-STAR ELECTRIC, Chicago, designs and produces high-voltage switches and other apparatus for the electric power industry. Delta-Star places great emphasis on engineering factors as well as fundamental and good design.

ESECO, Joliet, Illinois, designs and manufactures complex electrical and propeller-type devices used in heavy industry and in certain government departments, specializing in mobile units for furnishing "on the ground" power to jet planes.

LACLEDE-CHRISTY COMPANY, St. Louis, manufactures fire brick and silica brick, refractory specialties, glass industry refractories, and refractory supported arch and wall tile.

LESCHEN WIRE ROPE, St. Louis, manufactures rope for oil and gas drilling, bridges, elevators, derricks and cranes, marine uses, rope slings, and countless other uses.

McLAIN FIRE BRICK, Pittsburgh, Pa., is the largest producer of "pouring pit" refractory brick, comprising dry press and wire cut ladle brick, sleeves, nozzles, runners, hot top brick, mold plug brick, and special shapes.

QUAKER RUBBER, Philadelphia, and **QUAKER PIONEER RUBBER, San Francisco,** operate industrial rubber mills, on the Atlantic and Pacific Coasts. Rubber belting, hose, packing, and moulded rubber in every type and construction, together with many other products, serve industry, offering long wear and top performance.

THE RIVERSIDE METAL COMPANY, Riverside, N. J., manufactures non-ferrous alloys such as phosphor bronze, beryllium copper, nickel silver and cupro nickel, for industry.

VULCAN CRUCIBLE STEEL CO., Aliquippa, Pa., has been engaged exclusively, since 1901, in producing a complete line of tool steels—shock, die, hot work, high speed and special purpose. These steels come in standard or special rolled shapes, also finish forged to specification.

THE WATSON-STILLMAN COMPANY, Roselle, N. J. designs and manufactures standard and special hydraulic machinery for the plastics, metalworking, extrusion, railroad, ordnance, and general industries.

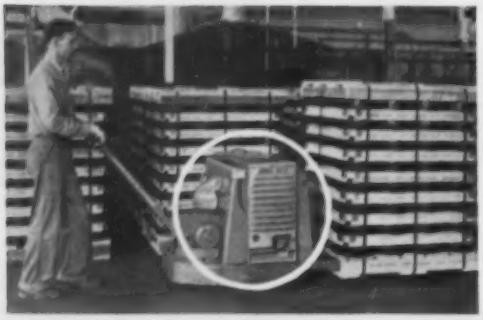
WATSON-STILLMAN FITTINGS, Roselle, N. J., specializes in forged steel fittings, in carbon, stainless and alloy steels for use in the chemical, petroleum, petro-chemical, power and other industries, particularly wherever high temperatures, high pressures or corrosive conditions exist.

Divisions of

H. K. PORTER COMPANY, INC.

Executive Offices: Alcoa Building, Pittsburgh 19, Pa.

Get the Advantages of READY-POWER on Your Electric Industrial Trucks



Get Live Power for Walkie Trucks

Ready-Power's popular bantam model "W" is equipped with dependable 12-volt automotive-type starting and ignition. Variety of idling speeds and easy accessibility make it ideal for all walkie trucks as well as rider trucks up to 2,000 lbs.

Work Your Fork, Platform, Tractor Trucks 'Round the Clock

Ready-Power gas-electric and LPG-electric units give materials handling trucks continuous, full power all the time. Slowdowns due to power fatigue are eliminated. The simple, all-electric control and live response make Ready-Power-equipped trucks rate high with truck operators.

Energize Lift Magnets on Your Electric Trucks

In the application shown at the left, the Ready-Power unit not only powers the truck, but also energizes the lift magnet for handling scrap metal. Ready-Power units are removable for shop adjustment while a spare keeps trucks working.

Get Diesel Electric for Lowest Ton-Mile Costs

Take a tip from the owners of industry's biggest trucks . . . power them with Ready-Power diesel-electric for maximum stamina, dependability, and lowest operating costs. Ready-Power offers power for every size and make of electric truck.

Your Truck is No Better than its Power . . . Write for Information on Ready-Power gas-electric, LPG-electric, and Diesel-electric Units

READY-POWER

The READY-POWER Co., 3822 GRAND RIVER AVE., DETROIT 8, MICH.

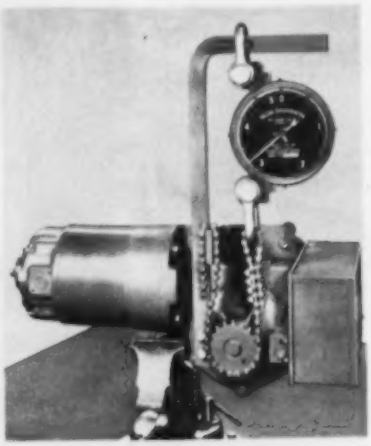
Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

beam sag that often occurs when a long rail loads heavy parts through the furnace. The new rail incorporates a welded box-type structure with a vertically aligned central separator surrounded by water cooling pipes. Since the central member is cooled on both surfaces it maintains its rigidity even at maximum temperature.

Inspection:

Checking torque of gear reduction motors.

A simple and rapid method of torque testing gear reduction motors is needed to determine whether power units are capable of handling designed loads without stalling.



Torque tester . . .

Motors are mounted in a bench vise in a test method developed by H. W. Crane Co., Chicago. The drive shaft applies force on a dynamometer through a sprocket and roller chain. One end of the chain is clamped to the lower clevis of the dynamometer. The other end is held manually so the sprocket teeth are firmly engaged in the linkage.

Torque developed by the motor through the gear reduction is indicated in pounds on the dynamometer dial. An L-shaped angle iron is bolted onto the gear reduction housing to anchor the dynamometer.

Cut upkeep costs with "FLOTE"

. . . recent water-wash spray booth discovery — Only 75 cents a day saves up to $3500 a year!

"FLOTE"* eliminates sinking paint sludge — even with heavy primers; stops clogging, backwall build-up!

Regardless of the type of water-wash spray booth you use — and no matter what organic finish you use — Wyandotte "FLOTE" will improve operating efficiency, cut maintenance costs. Just add "FLOTE" to your water system!

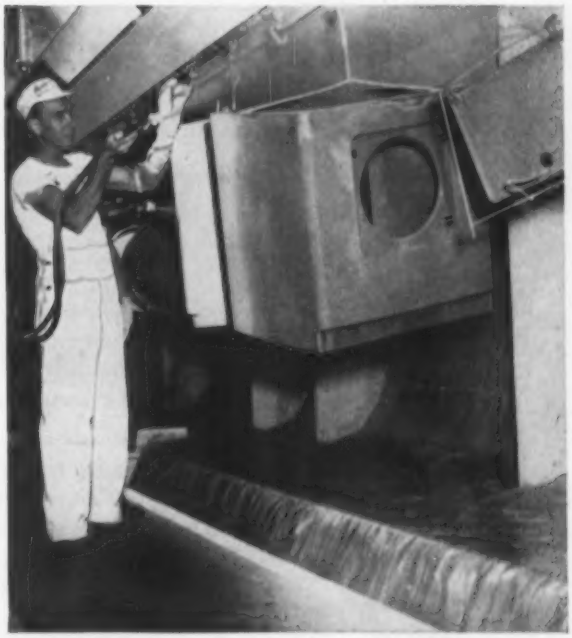
For "FLOTE" *floats* all types of paint overspray—even heavy primers—and *keeps them afloat* for easy skimming. Eliminates most foaming problems, too!

Enthusiastic users of "FLOTE" include: one of the world's largest camera manufacturers; a leading farm-machinery company; a large truck-trailer producer; air-conditioning firms; a leading furnace manufacturer; an aircraft factory — even a mammoth auto maker . . . plus appliance and furniture manufacturers, and many, many more!

If you'd like to *float* away *your* spray booth problems, and cut maintenance costs, mail coupon for full data on Wyandotte "FLOTE." Do it today!

Wyandotte Chemicals Corp., Wyandotte, Mich. Also Los Nietos, Calif. Offices in principal cities.

*PATENT APPLIED FOR



In a water-wash spray booth, like the one above, as little as 75 cents worth of "FLOTE" a day can save you up to $3500 a year! "FLOTE" is a *complete* product — nothing else to add!

Available in 150-lb. and 425-lb. steel drums.

Wyandotte CHEMICALS

REG. U. S. PAT. OFF.

J. B. FORD DIVISION

WYANDOTTE CHEMICALS CORPORATION
Wyandotte, Michigan

Send me further data on "FLOTE" ☐
Have a representative call ☐

Name _____

Firm _____

Address _____

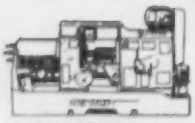
City _____ Zone _____ State _____

LARGEST MANUFACTURER OF SPECIALIZED CLEANING PRODUCTS FOR BUSINESS AND INDUSTRY

OUR JOB:

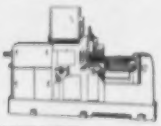
to provide the *Right Machine*

for **YOUR JOB**

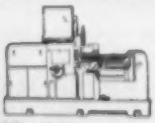


BAR AUTOMATICS
4 Spindle — 7 sizes, 1 to 7½"
6 Spindle — 9 sizes, ⅝ to 6"
8 Spindle — 6 sizes, ⅞ to 4"

CHUCKING AUTOMATICS
4 Spindle — 2 sizes, 10 and 12"
6 Spindle — 4 sizes, 8½ to 12"
8 Spindle — 2 sizes, 6 and 8"



TURRET LATHES
(Bar-Type — Fully Automatic)
Single Spindle — 3 sizes, 3½ to 8½



TURRET LATHES
(Chuck-Type — Fully Automatic)
Single Spindle — to 12" cap.

CHUCKING AUTOMATIC
Single Spindle ("Chuckmatic")
To 12" capacity

Management decisions regarding the purchase of new equipment are, and rightly so, reflecting an awareness of the fact that there are many areas of operation—other than actual machine design—which affect machining costs.

Machine performance, for instance, is being studied more closely in line with *the job to be done.* The buyer is becoming increasingly more conscious of the need for sales, service and engineering help—*when he needs it.* He is taking a closer look at the machine he is considering, in relation to the advantages of "operator familiarity"—will there be plenty of experienced help available.

Analyzing his problem and evaluating these important considerations, he usually finds *more* of the right answers at National Acme.

National Acme's experience in the design and manufacture of nearly 50,000 multiple-spindle bar and chucking automatics and fully automatic turret lathes provides a background of experience and versatility not to be found in less comprehensive lines of machines. This combination of *the RIGHT machine backed up by experienced and responsible engineering assistance* is hard to beat.

May we talk it over with you?

THE **NATIONAL ACME** COMPANY

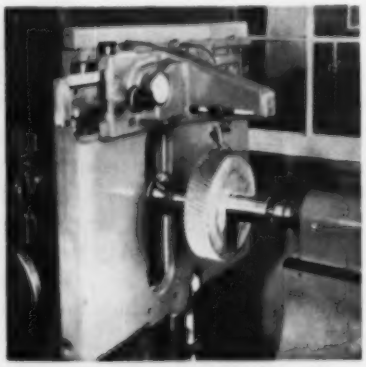
178 East 131st Street, Cleveland 8, Ohio

Machining:

Gear production simplified with expanding mandrels.

Sundstrand Machine Tool Co., Rockford, Ill., has simplified production of its gears with precision expanding mandrels, supplied by Scully-Jones and Co., Chicago.

These mandrels use an internal-expanding roller taper design. They take advantage of the elastic properties of metal, and expand the mandrel surface evenly to give an accurate, centering shrink-fit in the bore of the gear blank. The fit is accurate within 0.0001 in. A one-hand twist of the actuating cone seats it.



Holds to 0.0003 in. . . .

The mandrels are used in rough turning shaving, finish grinding and inspecting the gears. Pitch diameter runout on the gear teeth is virtually eliminated. Maximum runout on finished gear surfaces is about 0.0003 in. Little difficulty has been experienced in keeping gears within that tolerance.

Mounting the gear on a mandrel no longer is a critical step. Very little skill is required in their use. Unless seriously damaged, the mandrels permit running work true in the machine with little attention.

Accuracy is such that the mandrels may be used in the shaving process to correct tooth profiles.

A set of the mandrels is maintained solely for inspection purposes. Experience has indicated that the gears run just as true at the final inspection as at the first production step.

TECHNICAL BRIEFS

Heat Treating:

Bright treating stainless steel reduces customer costs.

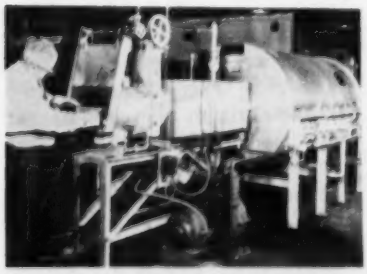
In practice, heat treating high alloy steels presents problems. Stainless steels require temperatures as high as 2000°F. At such temperatures, scaling occurs without proper surface protection.

This scale often is difficult and expensive to remove. Removal also may impair potential corrosion resistance and dimensions of the work.

Yet there is a continuous demand for bright heat treated special steels at a reasonable cost per pound of work treated. The Syracuse Heat Treat Corporation, Syracuse, N. Y., is now using new techniques with its bright hardening furnace at notable savings in heat treatment costs. Some tools and dies command a premium price because of marked increase in their production life.

High Temperature Furnace

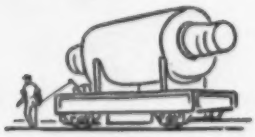
The bright hardening furnace was supplied by Surface Combustion Corporation, Toledo. It is a high-temperature, controlled-atmosphere, muffle furnace incorporating charge and discharge vestibules, refractory - lined heating chamber with full muffle and water-jacketed cooling chambers. Vestibules are equipped with inner and outer doors to minimize atmosphere loss during charging and discharging. The heating chamber contains an Inconel muffle of circular cross section.



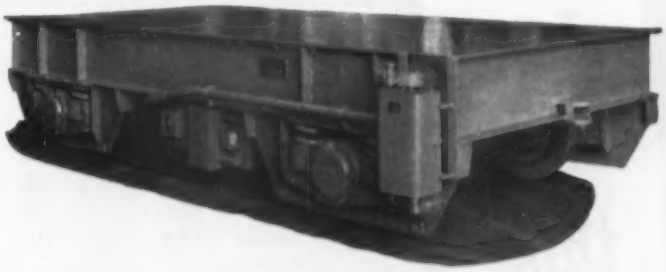
Low Cost Bright Stainless...

A prepared gas atmosphere fills the muffle, cooling chambers and vestibules. Ammonia gas is dissociated in an automatic generator. The resulting gas has a

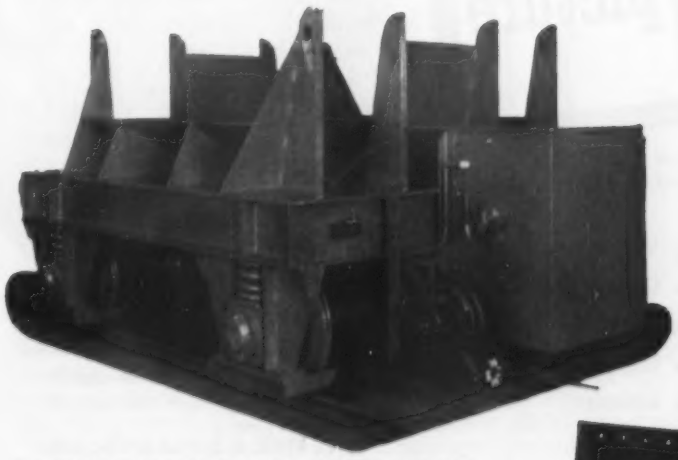
TRANSFER IT SAFELY *at Less Cost with* ATLAS



Atlas Safety-Type Transfer Cars are outstanding for moving heavy materials over short distances. Designed for storage battery, diesel or gas-electric, or cable reel service. Only one simplified control lever for safety. The car moves only when the operator holds the lever.



50-TON STORAGE BATTERY FLAT CAR



64-TON ELECTRIC FLAT CAR

Request "Walk-Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

Your plant is in this picture

IT might as well be YOUR plant, for in it, Kirk & Blum can bring your drawings to life . . . with substantial savings for you in costs and capital investments.

Kirk & Blum offers complete facilities for the fabrication of sheet and plate to 1/2" thickness—and light structurals. We specialize in aluminum, monel, stainless and other alloy fabrication.

In the modern 150,000 sq. ft. Kirk & Blum plant is to be found the latest metalworking equipment available, operated by skilled sheet metal craftsmen. Overhead cranes, to 25 ton capacity, serve entire assembly areas and interior rail siding. A new warehouse contains extensive inventories of materials. Coordinated for speed, versatility and accuracy, these facilities assure successful and economical completion of your products.

- Weldments
- Components
- Assemblies
- Sub-Assemblies
- Cabinets
- Housings
- Enclosures

THE KIRK & BLUM MFG. CO.
3200 Forrer Street
Cincinnati 9, Ohio
ESTABLISHED 1907

KIRK & BLUM
SHEET METAL FABRICATION

"Production at 1850° F averages 60 lb an hour . . .

composition of 75 pct hydrogen and 25 pct nitrogen. A dewpoint of −58°F is maintained at the generator for most production requirements.

Stainless, Tool Steels Treated

All types of stainless steels are processed in the hardening and annealing grades. The furnace also has proved suitable for any air hardening grade of steel. The processing cycle varies according to type and size of part under heat treatment. Furnace temperatures range from 1600-1950°F. Gross production rates at 1850°F average about 60 lb per hour with a cycle of five hours total time in the furnace.

Operating Cycle

In a typical operation cycle, a new tray of work is pushed into the charge vestibule every 30-35 minutes. Actual time interval depends on density of work load and metallurgical results desired.

The operator first withdraws a trayload of work from the water jacketed cooling chamber and moves it to the discharge vestibule. This chamber is purged with atmosphere gas, which is then burned. The inner door is opened and tray is pulled into the vestibule by a long rod. At this point, trays have been cooled to a temperature of about 150-160°F.

The operator next places a new tray in the charge vestibule. The chamber is purged with atmosphere gas before advancing the tray into the ready chamber.

This cycle is repeated as the trays advance through the preheat and high heat zones of the heating chamber and through the cooling chamber to the discharge vestibule.

Only one operator is required.

When fully loaded the furnace holds 11 trays. Each Inconel tray measures 8 x 12 x 4 in. high, weighs seven lb and holds about 27 lb of work.

The furnace can go "on-the-line" immediately after coming to tem-

perature. The muffle need not be "conditioned" by removing residual oxygen with several hundred pounds of scrap material, as often is the case with furnaces of this type. As soon as atmosphere has completely filled the furnace muffle, the first tray load can be charged. Work in this tray comes out bright and clean.

Customer Costs Reduced

The furnace was placed in operation at Syracuse Heat Treat over a year ago. To date, there have been no rejects due to furnace operation. Customers have accepted all production of correctly specified material. Considerable cost savings over methods previously used have resulted from bright heat treating stainless and other steels with this technique.

One manufacturer eliminated a costly electroplating operation. Another reduced extremely costly hand stoning operations (required on a special jewelers gear) from 30 minutes to 5 minutes because of the bright finish obtained.

A manufacturer of precision parts has been able to save $1.87 per piece by specifying this bright hardening method. Tighter specifications could then be introduced, since distortion was reduced and a final polish was eliminated. Where 96 to 144 hours were previously required for delivery to this last customer, finish heat treated parts now can be delivered in 48 hours.

Riveting:

Carbide tips extend peen life.

Redesigning peening tools and adding carbide tips eliminated rapid peen wear, and solved a tool breakage problem in riveting operations at International Business Machine Corp., Endicott, N. Y. Counter plates used on electric accounting machines now are turned out at the rate of 200 a day. Special high speed riveting machines are employed.

The very latest in
Package Type Plants
Producing
OXYGEN and NITROGEN
Simultaneously

With the introduction of our latest, improved design Package Type Generating Plants, production of high purity Oxygen and Nitrogen simultaneously *increases* production 60% over the production of Oxygen alone, *plus* a corresponding reduction in the *cost* of manufacture. Due to its compact design, a minimum of floor space is required and streamlined panel assembly insures instant visibility of all control gauges. Stock sizes from 1500 to 10,000 cu. ft. per hour. Larger and smaller sizes available. 99.99% Argon available on large size plants.

We invite your inquiry.

INDEPENDENT ENGINEERING COMPANY, Inc.
Manufacturers of
CONSULTING · DESIGNING · RESEARCH
CYLINDERS AND GAS PRODUCING EQUIPMENT
ACETYLENE · OXYGEN · HYDROGEN · NITROGEN
O'FALLON 4, ILLINOIS

PREMIUM CRANE SERVICE AT ECONOMICAL PRICES

Series "D" 'Load Lifter' Cranes are standardized, mass-produced cranes for average industrial service. They are priced far below other cranes for similar use, yet built into them are performance-proved features like those in "Shaw-Box" Heavy-Duty Cranes.

Three-girder bridge construction eliminates whipping and skewing. Bridge and trolley wheels are fixed on axles that rotate on antifriction bearings. Spotting is easy and accurate with fast-acting brakes and variable speed control, operated by push buttons on floor-controlled cranes and by master switches on cage-controlled cranes. You get the smooth efficiency of ball or roller bearings, plus gearing that operates in oil in sealed housings.

Put the dependable, economical service of a low-priced Series "D" All-Electric 'Load Lifter' Crane into your operations. You'll like the easy maintenance and the many protective features that safeguard man, load and crane. Capacities: 1 to 20 tons. Three basic types and three trolley styles available. Selection is easy. Write for Catalog 221 and make your choice.

'Load Lifter' CRANES

MANNING, MAXWELL & MOORE, INC. Muskegon, Michigan
Builders of "Shaw-Box" and 'Load Lifter' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' and 'American-Microsen' Industrial Instruments, and Aircraft Products.

Fourteen separate riveting operations are performed to assemble the counter mounting plates. The riveting machines are set to operate at 3200 impacts a minute. With steel peens only 60 plates could be assembled before the peens wore out of shape, and had to be replaced.

Tool Failure

Peen wear was cut considerably when IBM engineers refaced the peening tools with cemented carbide blanks, supplied by Carboloy Dept. of General Electric Co.

Carbide tipping the peens created a fatigue problem that led to shank breakage often enough to cause machine shutdowns and production losses. The point of failure usually was at the sharp shoulder below the threaded portion of the shank. The breakage was solved by machining a slight taper on the peening shanks between the face and threaded portion.

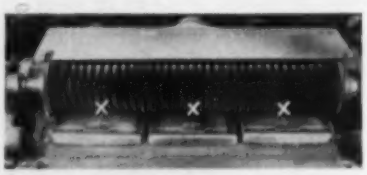
Finishing:

Draw marks eliminated by power brushes

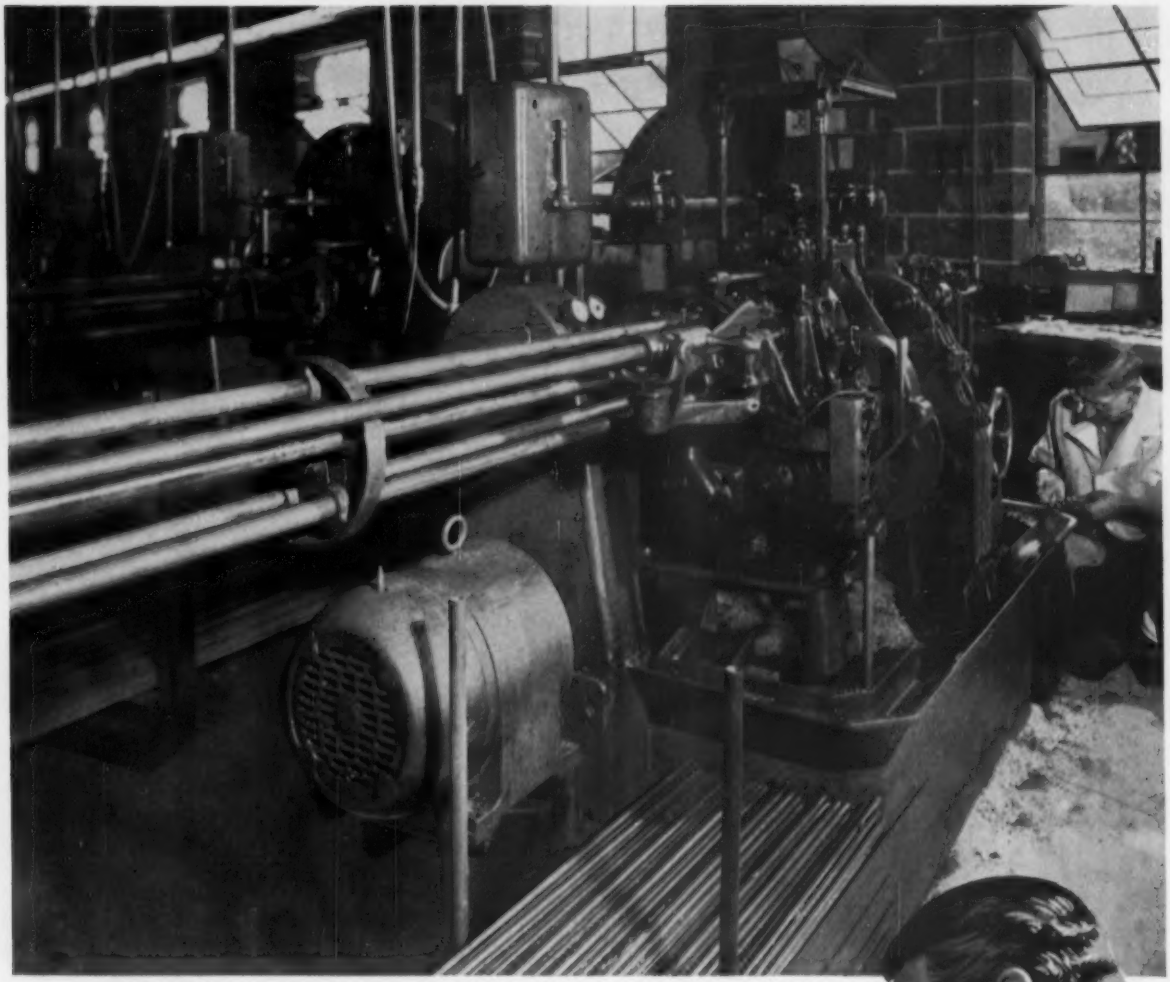
Heavy presses which form cold-rolled steel waffle iron lids often leave draw marks. The manufacturer was faced with the need for their removal prior to nickel plating.

Power brushes of The Osborn Mfg. Co., Cleveland, were mounted on a brush roll to finish three of the waffle iron lids at one time. The entire table moves in a reciprocating motion under the brush roll. Below the roll is a back-up roll of cloth buffs that regulates pressure.

Brushes are mounted on a shaft with spacers to make a brush face approximately 44 in. wide. They rotate at 1750 rpm.



No draw marks . . .



"Keep It Clean!"

...that's what I had to tell 'em all 'til I switched

to BRISTOL BRASS ROD

Right, sir! When you're running all-out on multiple-spindle machines . . . that's no time to have brass-trouble. For these extraordinary high-speed automatics take several lengths of rod in one setup, and pour out more than one hundred pieces a minute.

Well, there's no trouble in this shop with its eighteen automatics, because the machines are fed a steady diet of Bristol Brass Rod which (to quote the boss) "always comes clean . . . no scale . . . no spalling . . . and is never out-of-round."

Now if you have equally finicky ideas as to what Brass rod, sheet, strip or coil should be for *your* work . . . then bring it to Bristol and let us show you exactly what is meant by "Bristol-Fashion" . . . *everything ship-shape and right on time.*

Precision gunsight swivels and parts machined from Bristol Brass Rod

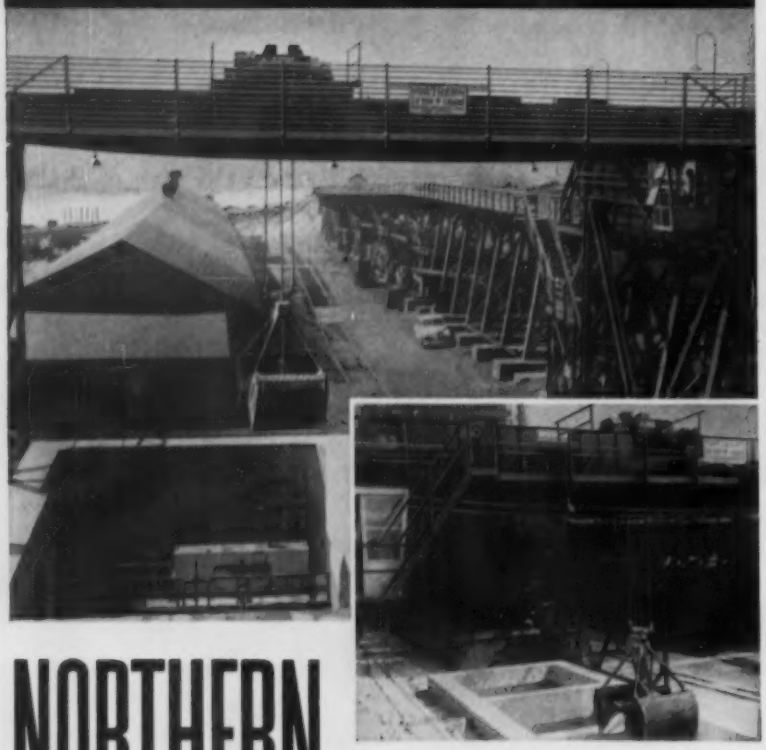
The Bristol Brass Corporation

Makers of Brass strip, rod and wire since 1850

BRISTOL, CONNECTICUT

OFFICES AND WAREHOUSES IN PRINCIPAL CITIES

Look Overhead . . . see "NORTHERN"



NORTHERN YARD CRANES

are built for rugged service

All Northern Overhead Electric Traveling Cranes are designed and built to provide the maximum in dependable operation under the most rugged conditions.

High efficiency and minimum maintenance are assured by close tolerance machining of all mechanical parts with turned and ground shafts, press fits of gears, wheels and bearings. Brakes are chosen to allow for extreme overload conditions. Extra heavy structural sections and rigid construction of girders with end trucks insure lateral stiffness, minimum vertical deflection and safe operation when the crane travels at full speed. Heavy duty type motors with anti-friction bearings are combined with especially selected control equipment to assure fine handling.

In plants where bulk material handling is required, as in the steel plant shown above, Northern cranes are a preferred investment for safety, dependability and efficiency.

Write for Bulletin SE-108

MATERIAL HANDLING EQUIPMENT BY NORTHERN

NORTHERN ENGINEERING WORKS
210 CHENE ST., DETROIT 7, MICH.

Atomic Energy:

First "canned-motor pump" installed by utility

Virginia Electric Power Co. has put into service the first "canned motor-pump" ever used to circulate boiler feed water in a closed-loop system. The pump was installed at the utility's Possum Point, Va., generating station. It is the first industrial application of the canned motor-pump, developed by Westinghouse Electric Corp., Pittsburgh, for the Atomic Energy Commission's atomic submarine engine project.

The pump design may later be used in atomic energy installations for commercial power.

Zero Leakage

The canned motor-pump is a hermetically-sealed unit. It provides a means of circulating a liquid coolant or other fluids in high-temperature, high-pressure, closed-loop systems with zero leakage.

Parts in contact with the circulated fluid are of corrosion-resistant alloys. There are no external shaft seals. Suction and discharge nozzles are welded into the pipe that forms the closed-loop system.

Design of the pump housing presented problems since the coolants may be corrosive. Casing of the special double volute pump is cast of a low-carbon, columbium-stabilized modification of the standard CH-20 type alloy.

Canned motor pump . . .

Every 3 seconds—a heated bar with this Magnethermic 10,000 cycle Induction Heater

This 10,000 cycle unit preheats 1" steel bars to 2300 degrees for upsetting at rate of one every 3 seconds or over 1,000 per hour.

Induction preheating for forging or extrusion has many advantages: speed, economy, cleanliness, close control, adaptability, increased die life and attractive working conditions.

But the question of which frequency—low, dual or high, sometimes confuses the issue. Each has its own place and its advantages.

Magnethermic makes induction heaters only, 60 through 10,000 cycles, and can give you experienced guidance on selecting the best frequency for your heating job.

Low—Dual—High Frequency?

ASK MAGNETHERMIC

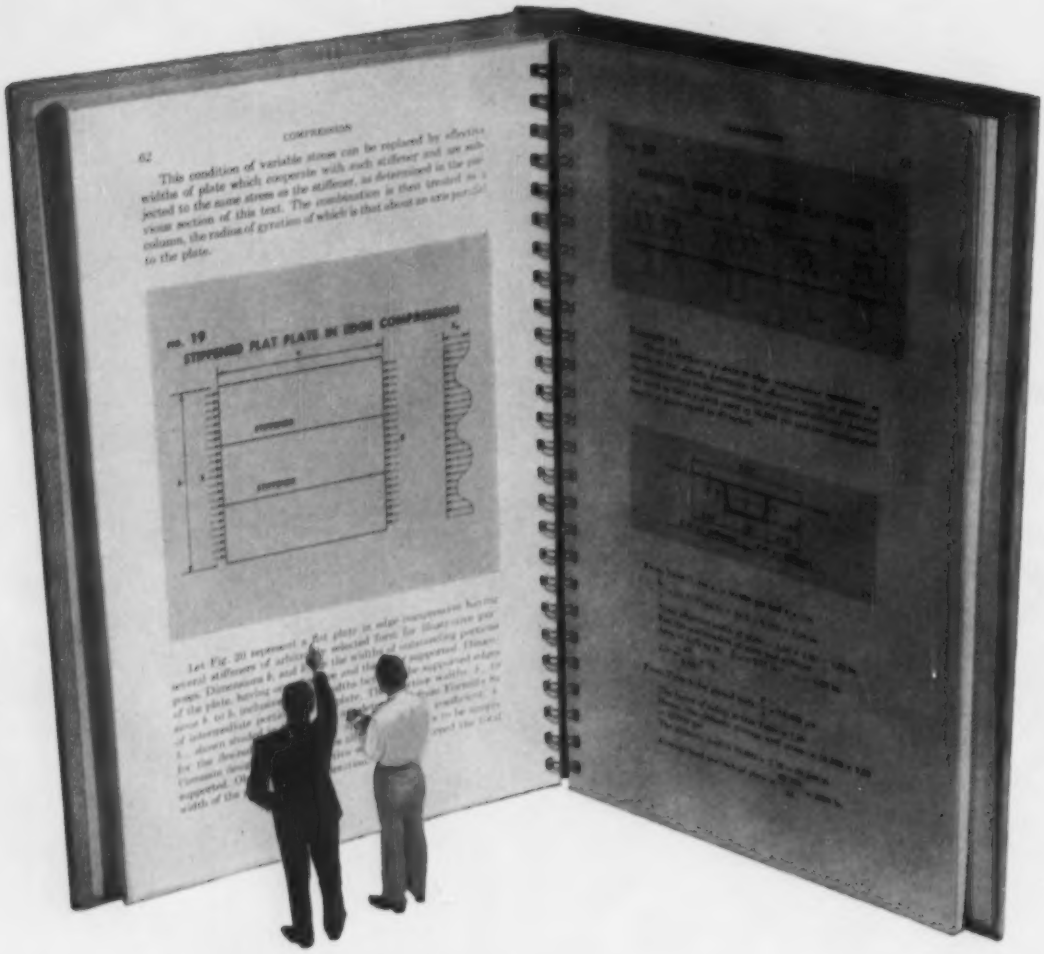
INDUCTION HEATING

MAGNETHERMIC®

corporation

3990 SIMON ROAD . YOUNGSTOWN 7, OHIO

60 THROUGH 10,000 CYCLES



You'll find it all here . . .

The information you need when designing for high strength steels

OUR new "Design Manual for High Strength Steels" is ready for distribution. Here are 174 pages of practical, authoritative information that you will find invaluable in designing your product for greater economy and efficiency by the sound use of high strength steels. No designer should be without it.

This excellent book covers in detail the problems of tension, compression, shear, beam stress, deformation and deflection. It fully describes the fundamental characteristics of low-alloy high strength steels, shows you how to design against corrosion, describes the application of formed sections. Complete with tables, formulas, and basic data covering this important field of design.

• • •

For your free copy, write on your company letterhead giving your title or department, to United States Steel Corporation, Room 5019, 525 William Penn Place, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS HIGH STRENGTH STEELS

USS MAN-TEN • USS COR-TEN • USS TRI-TEN

UNITED STATES STEEL

"finished volute casting has a wall thickness of 4-in., and outside diameter of 38½ in. . . ."

The alloy contains 0.08 pct max C, 12-15 pct Ni, 22-26 pct Cr and Cb 10xC. Ferrite content was held to a low limit to prevent possibility of sigma phase embrittlement as a result of welding the part into the piping system.

A forged pump casing was considered. But machining the complex passages would have required forging the housing in two parts. The two halves would need to be "kellered" and welded together, a difficult operation in the past experience of Westinghouse engineers.

Low carbon housing . . .

The pump housing incorporates a complex scroll configuration for the dual water passages. Tentative specifications called for a 5095-lb volute with 13,000 gpm capacity. The finished volute casting has a wall thickness of 4 in., an outside diam of 38½ in. and a 25-in. overall height. At acceptance the unit was tested hydrostatically to 4650 psi with zero leakage.

Cutting:

Warped metal-cutting saw trued with hammer

When a 10-ft diam metal cutting saw gets warped and distorted,

TWO machined parts $1.00
TEN Powdermet* PARTS . . . . $1.00 (10¢ each)

Don't cut parts—*Cut Costs* with YALE Powdered Metal Parts

Yes, powder metallurgy has an important price story—because when you save the extensive and costly operations involved in machining, it shows up in *more parts* and lower production costs!

But at Yale & Towne, there's another story of *equal* importance . . . *complete* engineering service, the kind you can trust—from consultation through production and delivery of parts that are *really* right!

Engineering service has given Yale & Towne its position of leadership in powder metallurgy. We are careful to *recommend only applications where Powdermet* parts will perform successfully.* Then, in design and production of these parts, Yale & Towne offers the experience, know-how, modern facilities and creative ingenuity that *assure* best results.

As a part of this complete engineering service, Yale & Towne maintains a continuous special training program for well-qualified engineers. These men become Powdermet* consultants—available to discuss the advantages and limitations of Powdermet* parts *right in your own plant.* They will show you how Powdermet* may cut your production costs and improve your product. And there is *no obligation* for this engineering counsel.

TAKE ADVANTAGE of Yale & Towne's skilled engineering assistance on your powdered metal problems.

Arrange for a visit by a Yale & Towne consultant —today!

Send Today for Free Informative Booklet on Powdered Metals

*Registered Trade Mark

YALE & TOWNE

THE YALE & TOWNE MANUFACTURING CO
Powdered Metal Products Division
9335 BELMONT AVE. • FRANKLIN PARK, ILL.

The Yale & Towne Manufacturing Company
Powdered Metal Products Division
9335 West Belmont Avenue
Franklin Park, Illinois

☐ Send Booklet ☐ Send information on Powdermet* parts for attached specifications or drawings.
☐ Have a Yale & Towne Powdermet* engineer call on me.

Name.....Title.....
Company.....
Street Address.....
City.....Zone.....State.....

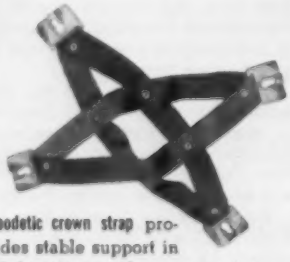
HERE'S WHAT WILLSON
SUPER-TOUGH®
HATS HAVE THAT NO OTHER
SAFETY HAT HAS!

It takes more than a strong, tough hat shell to provide full head protection—*both external and internal!* Only Willson Super-Tough® Hats and Caps give you that *extra* protection!

And that *extra* protection and wearer comfort is possible because of this unique, patented geodetic crown strap and pneumatic head band, developed by Cornell Aeronautical Laboratory, Inc.

Get the complete story on this new, revolutionary, scientific advance in head protection. Write for this new manual and catalog on head protection.

Super-Tough® hat cut away to show how the patented head gear fully cradles the head.



Geodetic crown strap provides stable support in all directions with no concentration of load in tie string on top of the head.

Patented pneumatic cushioned, all plastic head band providing scientific "metered air" shock absorption.

More Than 300 Safety Products Carry This Famous Trademark
WILLSON®

Leaders in Research and Development of Safety Equipment Since 1870

WILLSON PRODUCTS, INC., 231 WASHINGTON ST., READING, PA.

E. F. Donley's Sons, Cleveland, take a machinists' hammer to it. The 1-in. thick saw weights more than 3000 lbs, so Donley sawsmiths moved to the site, rather than handle it in their own shops.

No machinery has been devised to true up a blade this size, so the operation was one of artisan skill rather than modern precision. Saw craftsmen speak of "feeling the grain" in order to determine where it is tight or loose. Ridges, warped and distorted areas then are pounded flat manually.

Hammer away . . .

The blade is used on a cold saw machine for cutting huge metal billets. High speed tool bits are inserted in the saw rim, permitting cuts in alloy steel.

Chemicals:

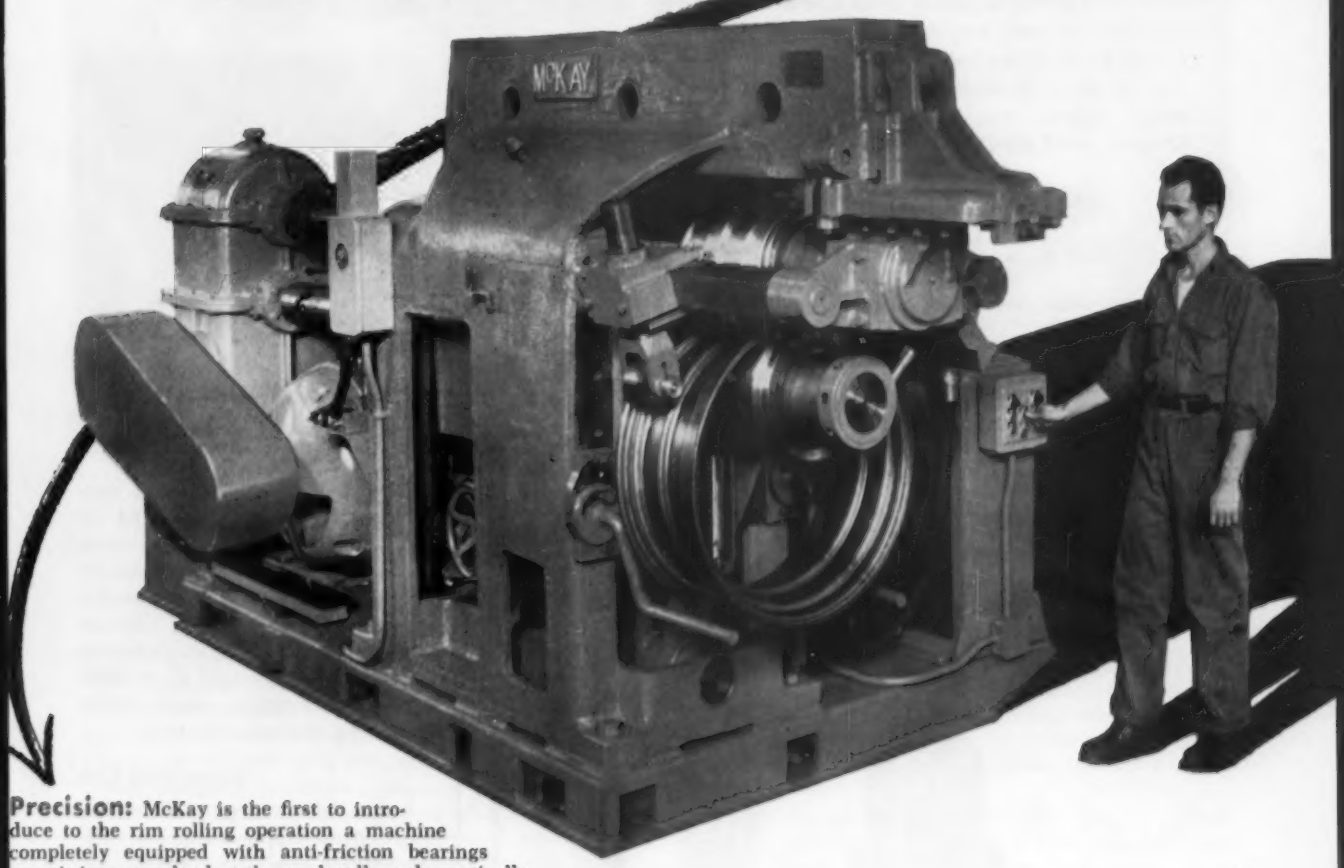
Fluorocarbon-lined hose withstands pyroxylin 3 years

A fluorocarbon-type resin liner has tripled life of flexible hose used in handling pyroxylin and other adhesives. Hose previously used by Compo Shoe Machinery Corp., Boston, Mass., in their machines was of conventional construction, and lasted no more than a year.

The hose transfers adhesive from the machine storage pot to

4 REASONS Why Wheel Manufacturers Specify

McKAY RIM ROLLERS



Precision: McKay is the first to introduce to the rim rolling operation a machine completely equipped with anti-friction bearings permitting more load at the work rolls and practically eliminating maintenance.

Precision setup of work roll shafts is accomplished either manually or by motor-operated screw adjustment of toggles, permitting the exceptional accuracy needed for the production of rims for tubeless tires.

Ruggedness: A one-piece, cast steel housing absorbs all work loads. A 2-Hi, oil-tight gear case drives both work roll shafts through husky universal spindles providing quiet trouble-free operation.

Performance: Accurate, repetitive cycling is assured by solenoid-controlled hydraulic four-way and flow control valves. An electric timer determines the dwell period of the rim rollers under full load at full depth.

Compact Design: All equipment is mounted on a single base, including the hydraulic power unit and valve panel as well as the electrical equipment and controls. Only 70 square feet of floor space required. A simple connection to your power source and you're in business.

ENGINEERS AND DESIGNERS OF
EQUIPMENT FOR THE AUTOMOTIVE,
FABRICATING AND STEEL INDUSTRIES

McK

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

Precision gears
custom-made by Perkins
meet your specs
and *your time-table*

Throughout industry, the name PERKINS in association with GEARS has long been symbolical with quality and service. Hence — be they washing machines or supersonic aircraft engines — if the component gears of the finished product are *custom-made by Perkins*, they will be *better* products. *You furnish the specifications, we'll produce the gears!*

PERKINS MAKES in all materials, metallic or non-metallic, and in any size, to your specifications: helical gears, bevel gears, sprockets, ratchets, worm gears, spur gears with shaved or ground teeth, ground thread worms.

NOTE: The **PERKINS PRECISION SPRING COILER** is the latest development in the spring coiler field and eliminates entirely the use of arbors and long set-up time. It is a complete self-sufficient machine and enables you to make the spring you want *when* you want it — in seconds. The coiler produces any type of spring, in any diameter and any pitch with this range: Wire Sizes .005 to .125. Diameter from 3/32" to 12" and larger. Size of the compact coiler is only 7½ x 16". **A POWER MODEL** mounted on a welded steel console cabinet base is also available. Full information on request.

Perkins Machine & Gear Co.
103 Circuit Ave., Springfield, Mass.

the nozzle. In twin head machines, where duplicate adhesive systems are provided, a flexible hose is provided for each system. This permits production runs of different types of materials requiring different adhesives. Several adhesives may be used in the machines, including solvent activating, heat activating and pressure sensitive adhesives.

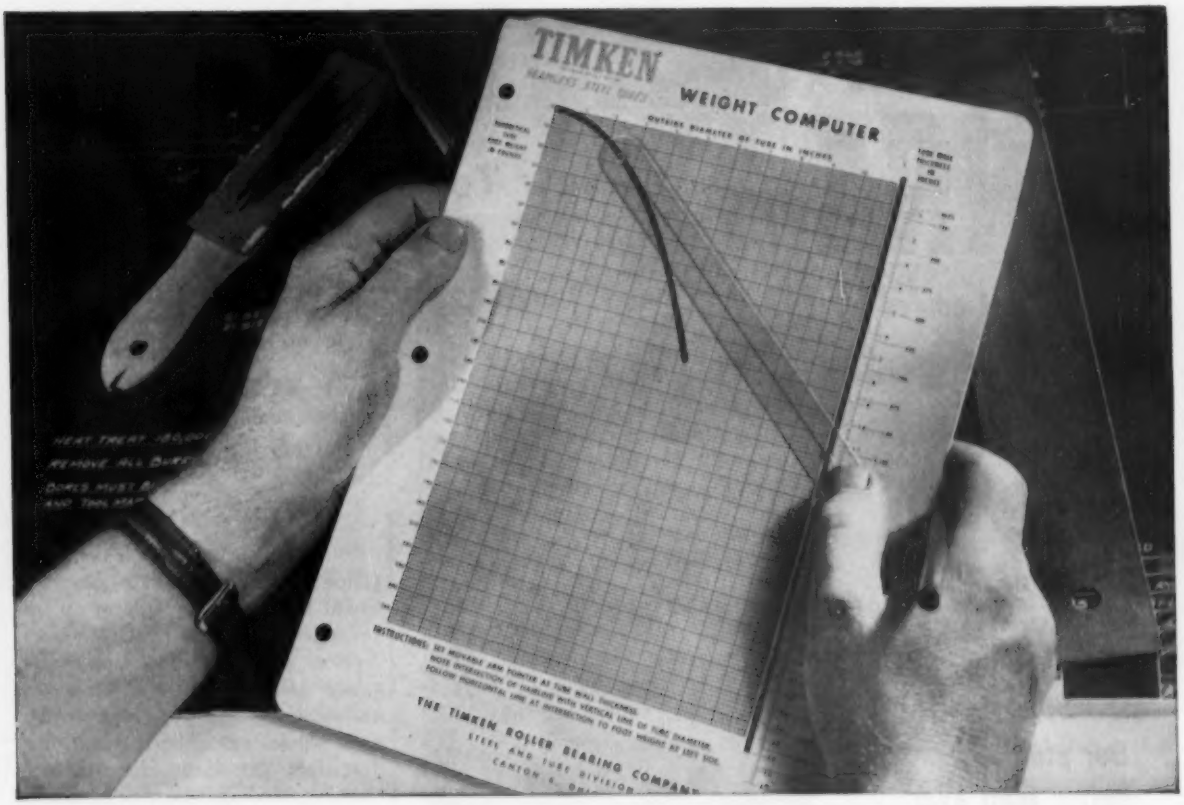
Resists adhesives . . .

Experience indicated that conventional hose was damaged by the adhesive, and fittings came loose. The adhesive may be under pressure as high as 150 psi, needed to start adhesive flowing through the small nozzle orifices. Defective hose had to be replaced at the first sign of weakening, substantially increasing maintenance costs.

Three-Year Life

Resistoflex Corp., Belleville, N. J., first supplied Compo with the special hose three years ago. Field service men have reported back to Compo's engineering department that the new hose—after three year's use, is virtually unaffected by the adhesives and the constant handling and flexing.

The fluorocarbon material has extended shelf life and operating life and is unaffected by a wide variety of chemicals and industrial fluids. Three-piece stainless steel fittings are corrosion resistant. They are swaged directly to the steel sheath, so the fittings cannot blow off, and provide a leakproof connection. The hose is jacketed with stainless steel wire braid.



This free computer quickly figures the weight of steel tubing

WITH this handy little computer, you can quickly figure the weight of steel tubing. You set the slide at tube-wall thickness and O.D. and simply read off the tube weight per foot. Write us and we'll send you one. There's no obligation, of course.

This computer is a small example of the helpful service the Timken Company offers manufacturers of hollow steel parts. Even more important: our engineers will be glad to study your problem and recommend the most economical tube size, *guaranteed* to clean up to your dimensions.

Many companies that formerly used bar stock for their hollow parts are making significant savings because they switched to Timken® seamless tubing. In addition to the big reduction in scrap loss, they save a great deal of machining time. Frequently, finish boring is the first production step. Machine tools are released for other jobs.

Timken seamless tubing has fine forged quality because it is made by a piercing process which is basically a forging operation. Write us now on your company letterhead for the handy tube weight computer. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

Now, more than ever, you can depend on

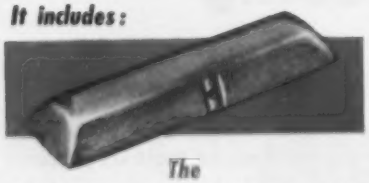
HANNA

as your best source for

PIG IRON

- Our merchant capacity is bigger than ever
- Our plant is better than ever
- Our product range is greater than ever

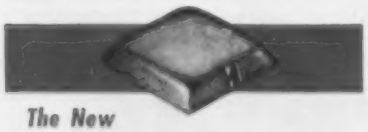
It includes:



The

HANNA 38-POUND PIG

The foundryman's favorite standard pig. Available in all grades, silvery and HannaTite. A good example of the quality that has made Hanna "the best known name in iron."



The New

EXCLUSIVE HANNATEN INGOT

For 10-lb.-pig users, this new ingot means no free-carbon pockets, finer grain structure, more even melting. Available in all grades, silvery and HannaTite—an extra-close-grain iron.

THE HANNA FURNACE CORPORATION

Buffalo • Detroit • New York • Philadelphia

Merchant Pig Iron Division of

NATIONAL STEEL CORPORATION

FREE AIDS

New Technical Literature:

Materials handling

A new 4-page folder, first of a series on company products, describes the 500 Series fork lift truck with 5000 lb capacity. Detailed specifications and operating data on lift, height, weight capacity, turning radius and speed of travel are given. The 500 Series is available for gasoline, LP-gas or diesel operation. *Towmotor Corp.*

For free copy circle No. 1 on postcard, p. 161

Flooring repair

Step-by-step procedure for repairing concrete floors with Embeco Pre-Mixed Mortar, a new non-shrinking floor compound, is given in a newly-available folder. The mortar, ready-to-use after mixing with water, is reported to provide repairs with high compressive and flexural strength. *The Master Builders Co.*

For free copy circle No. 2 on postcard, p. 161

Steel tubing

Four classifications of carbon and alloy steel tubing — mechanical, pressure, airframe and aircraft mechanical—are described in a new 8-page catalog. Both seamless and electric resistance welded tubing, as well as tube fabricating and forging, are covered. Catalog is titled, "Ostuco Tubing." *Ohio Seamless Tube Division of Copperweld Steel Company.*

For free copy circle No. 3 on postcard, p. 161

Rubber insulation

A data chart just made available describes such ARco form-dipped rubber parts as slips, clamps and grommets, and discusses the industries they serve, typical applications and the engineering of rubber insulated metal parts. Tables indicating die sizes and available standard design and sizes of grommets are also included. *Automotive Rubber Co.*

For free copy circle No. 4 on postcard, p. 161

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 161.

Precision grinding

"How to Select Wheels for Precision Grinding Tool and Constructional Steels," is the title of an informative booklet available from Norton Abrasives. Articles and tables tell reader how to select grinding wheels for tool steels, with special attention given to the precision grinding of constructional steels. *Norton Co.*

For free copy circle No. 5 on postcard, p. 161

Clarification filters

The complete line of Sel-Rex double duty filters for liquid clarification or solids recovery is discussed in a series of new catalog sheets. Sheets show standard portable, mobile and stationary units ranging in capacity from 250 to 18,000 gph. Incorporating special design features, these units are reported to permit thorough cleaning in 15 minutes. Also illustrated are new Sel-Rex filter elements—stainless steel mesh annular and leaf type elements and disposable paper cartridges. *Baas and Co., Inc.*

For free copy circle No. 6 on postcard, p. 161

Openhearth trucks

New model openhearth fork lift trucks are shown in a 4-page folder, which includes illustrations, diagrams showing outline dimensions, and very detailed specification information. The trucks, models FTOH 60-24 (gasoline power) and FTDOH 60-24 (diesel power) are pictured at work in the field. Operating data are given. *Allis-Chalmers, Buda Div.*

For free copy circle No. 7 on postcard, p. 161

Inspection unit

A combination bench center and surface plate is shown in a 4-page bulletin. Advantages of the tool as a self-contained inspection unit for tool room, inspection department, or at the machine are covered, together with construction features and price information. *Price Engineering Co.*

For free copy circle No. 8 on postcard, p. 161

Air valves

"Manually and Foot Operated Air Valves, 0 to 4000 psi" are the subject of a 4-page folder now offered. Photos of the various units, valve sizes, ordering information and valve characteristics are given. *Barksdale Valves.*

For free copy circle No. 9 on postcard, p. 161

Screw machine products

A review of company facilities for the production of aluminum automatic screw machine products is contained in an 8-page illustrated booklet. Described are multiple-spindle automatic screw machines and equipment for secondary chucking operations, drilling, broaching, centerless grinding, milling, polishing and deburring. Related operations, such as heat-treating, brazing and welding, plating and anodizing, painting and assembly are also discussed. *Harvey Aluminum, Div. of Harvey Machine Co., Inc.*

For free copy circle No. 10 on postcard, p. 161

Internal grinding

An 8-page folder describes new Series 800 high frequency wheelheads. Specifications, including bearings, lubrication, coolant and power source, are fully discussed. Information is also given on alternators and high-frequency motors. *Bryant Chucking Grinder Co.*

For free copy circle No. 11 on postcard, p. 161

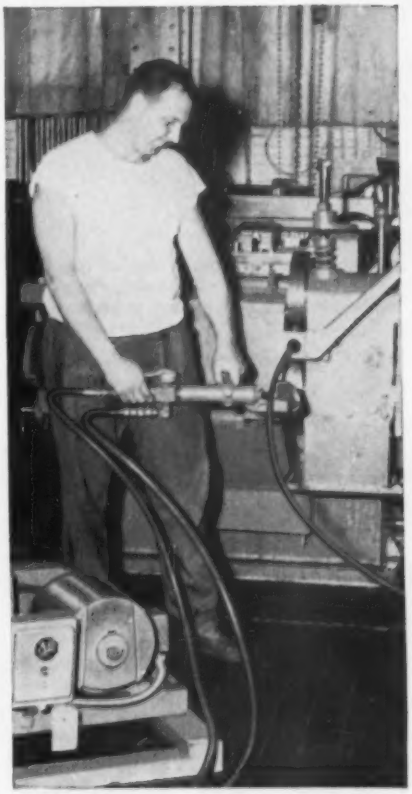
Nitrogen generators

A large, detailed flow diagram and a complete explanation of operation are included in a new 6-page bulletin on nitrogen generators. Also shown is a detailed data chart specifying utility requirements for nine of the models and composition graphs giving exact analysis of Nitrogen delivered with different air-fuel ratios. *C. M. Kemp Mfg. Co.*

For free copy circle No. 12 on postcard, p. 161

MANCO GUILLOTINE HYDRAULIC

UTILITY PRESS



Fast, easy to use, the Manco Utility Press can be operated by hand valve, as shown above, or by foot valve if desired.

10 Tons Thrust IN PORTABLE UNIT

Here is a highly versatile and powerful hydraulic utility press. Available with different yokes for punching, coining, straightening, riveting, swaging, etc. 2" stroke, ⅝" reach, 1¼" daylight. Special yokes available to meet your requirements. Equipped with Manco 3 h.p. electric hydraulic pump. Weight of head, 18 lbs. The weight of the pump unit including motor is 300 lbs.

NEW MANCO GUILLOTINE CATALOG

also available on complete line of special hydraulic tools for cutting, shearing, punching, bending, riveting.

WRITE FOR COMPLETE INFORMATION

Manco Mfg. Co., Bradley, Illinois IA-118

Please Send Me:

☐ Bulletin on Utility Press

☐ New Manco Guillotine Catalog

Name_____

Firm Name_____

Street_____

City_____ State_____

Looking For

LOW COST

Stainless Steel?

...then you want

MicroRold® 430!

MicroRold Type 430 is a straight chromium-stainless with a nominal composition of 17% chromium. Though it is less resistant to corrosion, it retains all of the other desirable qualities of stainless and has proven very satisfactory in a wide range of mild corrosion applications.

MicroRold 430 is the least expensive of all stainless types because it does not contain nickel. This results in a 7¾c per pound difference in base price between Type 430 and Type 302, the most popular higher grade stainless. A saving of $155 per ton is possible and is of merit to cost-conscious fabricators.

Considering the price advantage, with no sacrifice in quality when applied properly, you will find MicroRold 430 a worthwhile material for your product.

Your steel distributor can help you get the most for your stainless steel dollar. He will gladly tell you the MicroRold Story.

Washington Steel *Corporation*

WASHINGTON, PENNSYLVANIA

PUNCHES·DIES

RIVET SETS · COMPRESSION RIVETER DIES

Made of highest standards and uniform quality thus insuring maximum service. *Since 1903*

Large inventory of stock sizes of round punches and dies, also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

Write Dept. B for New Catalog 54

GEO. F. MARCHANT COMPANY

1420-34 So. ROCKWELL STREET CHICAGO 8, ILLINOIS

FREE TECHNICAL LITERATURE

Air-powered equipments

Controlled air-power devices are described in Bulletin ML-3, an 8-page folder. The company's air motor and its interchangeable valves as well as illustrations and descriptions of such standard items as drill press feeds, vises, hydrochecks, rotary feed and index tables, self-contained drilling units, valves and cylinders are included. *The Bellows Co.*

For free copy circle No. 13 on postcard, p. 161

Reinforced plastic

A new 20-page reference manual describes the advantages, applications and procedures for using "Scotchply" brand reinforced plastic. Sixty-two illustrations show possible application for the product in various industrial fields. Such procedures as machining and handling, molding, sanding and grinding, sawing, milling, shaping, turning, drilling and tapping the material are included, together with other information on properties and application. *Minnesota Mining & Mfg. Co.*

For free copy circle No. 14 on postcard, p. 161

Resistance welding

A 12-page general machine catalog for electric resistance welding is divided into four sections. These cover Industrial Applications, Manufacture and Service, Principles of Operation, and Types of Electric Resistance Welding machines. Application and specification data, together with a behind-the-scenes look at the company's design, engineering, fabrication, testing, service, installation and maintenance facilities are included. *Sciaky Bros., Inc.*

For free copy circle No. 15 on postcard, p. 161

Automatic turret lathe

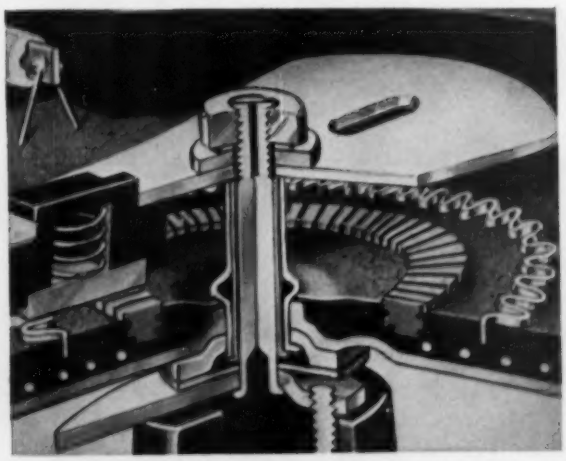
A 12-page bulletin describes the company's automatic turret lathe Models 6DRE-40 and 6DREL-40, with new headstock for fast metal removal, speed and feed range to handle a variety of materials and machining operations, and automatic electric control of spindle and slides. Illustrated are tooling and typical applications for the two models. *Potter & Johnston Co.*

For free copy circle No. 16 on postcard, p. 161

Extruded Shape Cuts Assembly Over Half

A Ward Leonard Type M Vitrohm rheostat using contacts made from extruded shapes

Ingenious application eliminates hand assembly, makes absolutely uniform stationary contacts in Ward Leonard power rheostats



CROSS SECTION VIEW of a Ward Leonard Vitrohm Type S rheostat showing how contacts are embedded in a vitreous enamel.

Ward Leonard Electric Co., Mount Vernon, N. Y., makes a line of high quality power rheostats marketed under the trade-name Vitrohm. Anywhere from 41 to 161 individual stationary contacts, or buttons, have to be embedded with their resistance elements in an insulating vitreous enamel—all contacts uniformly set and spaced, for uniform performance. Their patented process originally used buttons blanked out of sheet brass—hand assembled and spaced on a steel wire to hold them while the vitreous enamel was fired.

Ward Leonard refined the process and for four models now starts with the extruded shapes shown above. The stock is accurately slotted for correct spacing, forming a continuous line of buttons connected by a triangular "wire"—which is an integral part of the extruded shape. When sections are curved, the buttons remain uniformly spaced and oriented. After the button assemblies are embedded in the vitreous enamel, the connecting wire is easily milled off. Ward Leonard gets absolute uniformity with less effort and fewer rejects—it gets healthy dollar savings, despite the fact that more than half of the extruded shape is milled out.

Imagination applied to extruded shapes can pay big dividends—lower direct labor costs—fewer machining operations—less scrap—improved product quality. Your Anaconda representative will be glad to work with you. The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 6886

ANACONDA®

EXTRUDED SHAPES

Short cuts to a finished product

Postcard valid 8 weeks only. After that use11/10/55

Marshall-Richards vertical inverted tube blocks in operation for 2 years at Yorkshire Copper Works Ltd., Leeds, England. Typical drawing cycle, from 1.875" o.d. and .094" wall thickness to .322" o.d. and .028" wall thickness, in 8 passes. Drawing speeds from 225 to 2,025 fpm available.

An Addition . . . That Multiplies Our Ability To Serve You

Fenn will now build and sell, on this side of the Atlantic, the outstanding wire and tube drawing machines of Marshall-Richards Machine Company, Ltd., of England.

You can now meet your every wire and tube fabricating need from one source, because these machines perfectly supplement Fenn's wire shaping mills, rolling mills, Turks Heads and swaging machines.

The Fenn Manufacturing Company

316 Fenn Road,
Newington, Connecticut

•

Wire Shaping Mills
Precision Rolling Mills
Turks Heads
Swaging Machines

FENN

FREE TECHNICAL LITERATURE

Truck-mounted crane

Bulletin H-5-1 describing the all-hydraulic truck-mounted Hydrocrane is offered, together with a specification sheet, in a literature folder now available. Photographs show the equipment on the job, and illustrate its use as a 9-ton capacity lifting crane or as a clamshell excavator with ½-yd. bucket. Designed expressly for mounting on a conventional motor truck, the unit can also be equipped with a 39-in. lifting magnet. Other features mentioned include travel speeds to 50 mph on the highway, standard 2-piece or optional 3-piece boom, etc. *Bucyrus-Erie Co.*

For free copy circle No. 17 on postcard, p. 161

Roller conveyors

The new A-F General Purpose Roller Conveyor is discussed with text, drawings and photographs in a 6-page booklet. The literature offers a full description of this pre-engineered roller line, showing key product features, typical installations and types and sizes of conveyors available. A summary of the company's complete roller line is included. *Alvey-Ferguson Co.*

For free copy circle No. 18 on postcard, p. 161

Submerged combustion

Bulletin No. 110 on submerged combustion equipment is now available. It tells how the application of high velocity burners to submerged combustion techniques offers industry one of the most effective methods for heating a liquid, and shows dimensions and specifications and some applications. *Thermal Research & Engineering Corp.*

For free copy circle No. 19 on postcard, p. 161

Electric truck

A 4-page circular covering a new short-coupled Jacklift electric truck is offered. Truck is described as the shortest "walkie" electric pallet truck on the market. Specifications are included together with construction details and various photographs and drawings. *Lewis-Shepard Products, Inc.*

For free copy circle No. 20 on postcard, p. 161

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on page 156

Brass manufacturing

"Behind the Scenes," a full-color booklet, discusses the company's operations and facilities in the making of brass, bronze and aluminum products. Melting, extrusion, rod and wire forming, forging, pressure die casting, product control, and shipping are some of the subjects covered in various sections. *Titan Metal Mfg. Co.*

For free copy circle No. 21 on postcard.

Plant site survey

"A Seven-State Plant-Site Trip . . . In 5 Minutes" takes the reader on a tour through the territory served by the Company, with respect to such plant-location considerations as labor, housing, available buildings, taxes, utilities, municipal services, fuel, etc. Information on particular plants of this company and on some of its affiliates is included. *American Gas & Electric Service Corp.*

For free copy circle No. 22 on postcard.

Abrasive wheels

Simex Red Wheels for such rough production jobs as grinding welds, removing flash and bead, cleaning up rough ragged surfaces and edges and for all types of stainless steel are described in a 4-page bulletin. The lightweight, rigid type reinforced resinoid bonded abrasive wheels, for use on portable disc-type and right-angle type grinders, are shown in depressed center or raised hub shapes in 7-in. and 9-in. diams. *Simonds Abrasive Co.*

For free copy circle No. 23 on postcard.

Wire products

Four catalogs are offered, each covering a different product line. These include: industrial wire cloth in bulk or fabricated parts; gripper woven wire slings for materials handling; woven wire conveyor belts for use in metalworking, ceramic, food and chemical processing; and metal specialties for use in heat treating and processing. *Cambridge Wire Cloth Co.*

For free copy circle No. 24 on postcard.

Hole punching units

A hydraulic stripping unit using compressibility of liquids, called a Hydra-Spring, is the heart of the Type HS hole punching unit described in a bulletin now available. Units, described as independent and self-contained, punch and strip materials up to ¾ in. thick, and may be set up on templates or T-slotted plates in stamping presses and press brakes. *Wales-Strippit Corp.*

For free copy circle No. 25 on postcard.

Company introduction

A comprehensive introduction to the company, its divisions, products and the industries it serves is contained in the bulletin, "This is Byron Jackson Division of Borg-Warner Corporation." Described in text and pictures are the pump, oil tool, industrial rubber and electronic divisions, as well as the company's oil field service section. *Byron Jackson Div., Borg-Warner Corp.*

For free copy circle No. 26 on postcard.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 11/10/55

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80

If you want more details on products advertised in this issue fill in below:

Page ..... Product .....

Page ..... Product .....

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 11/10/55

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80

If you want more details on products advertised in this issue fill in below:

Page ..... Product .....

Page ..... Product .....

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

Production threading

A new bulletin describes Scru-Broach, a machine for production threading of large nuts and other internally-threaded parts. The machines, available in one-, two- and four-station models, have been applied to high production operations where close tolerances must be held, such as the broaching of automotive steering gear ball-race nuts. The bulletin discusses the two special broaching tools employed in the Scru-Broach method, as well as illustrating representative machines, tools and parts produced. *Ex-Cell-O Corp.*

For free copy circle No. 27 on postcard.

Aluminum plate, barstock

The features of aluminum tooling plate and barstock, its advantages, and typical applications are fully described in a new aluminum products brochure just made available. *Red Seal Metals Co.*

For free copy circle No. 28 on postcard.

Radiation detector

Features of a pen-sized major exposure dosimeter, for instant detection and warning of dangerous exposure to radiation, are discussed in a 2-page folder. The literature describes how the instrument works and where it may be applied. *Electromation Co.*

For free copy circle No. 29 on postcard.

Alloy studs, bolts

Heat treated alloy steel studs and bolts are the subject of a 22-page catalog. Sizes, threads available, list prices, weights and extras offered are covered. *Pawtucket Mfg. Co.*

For free copy circle No. 30 on postcard.

Power shovel

A new bulletin discusses recently introduced one-half cubic yard power shovel, 13 to 15-ton capacity crane — the Lima Type 24 Jobmaster. It illustrates and describes the machine's applications as shovel, crane, dragline or pull shovel with crawler, wagon or truck mountings. *Baldwin - Lima-Hamilton Corp.*

For free copy circle No. 31 on postcard.

FOR MORE LITERATURE

Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers.

Cut nails

Cut nails for flooring and finishing, furring and cornices, etc., are discussed and illustrated in a 12-page catalog which includes types available, sizes and price information. *Wheeling Corrugating Co.*

For free copy circle No. 32 on postcard.

Proportional controllers

Line of electric proportional controllers for use in control of dew point, pressure, temperature and other factors in batch process, combustion atmosphere and heat treating furnace applications is described in new bulletin. Functions of the various types of electric control, components of the control system and typical installation views are included. *Foxboro Co.*

For free copy circle No. 33 on postcard.

Nuclear Reactors

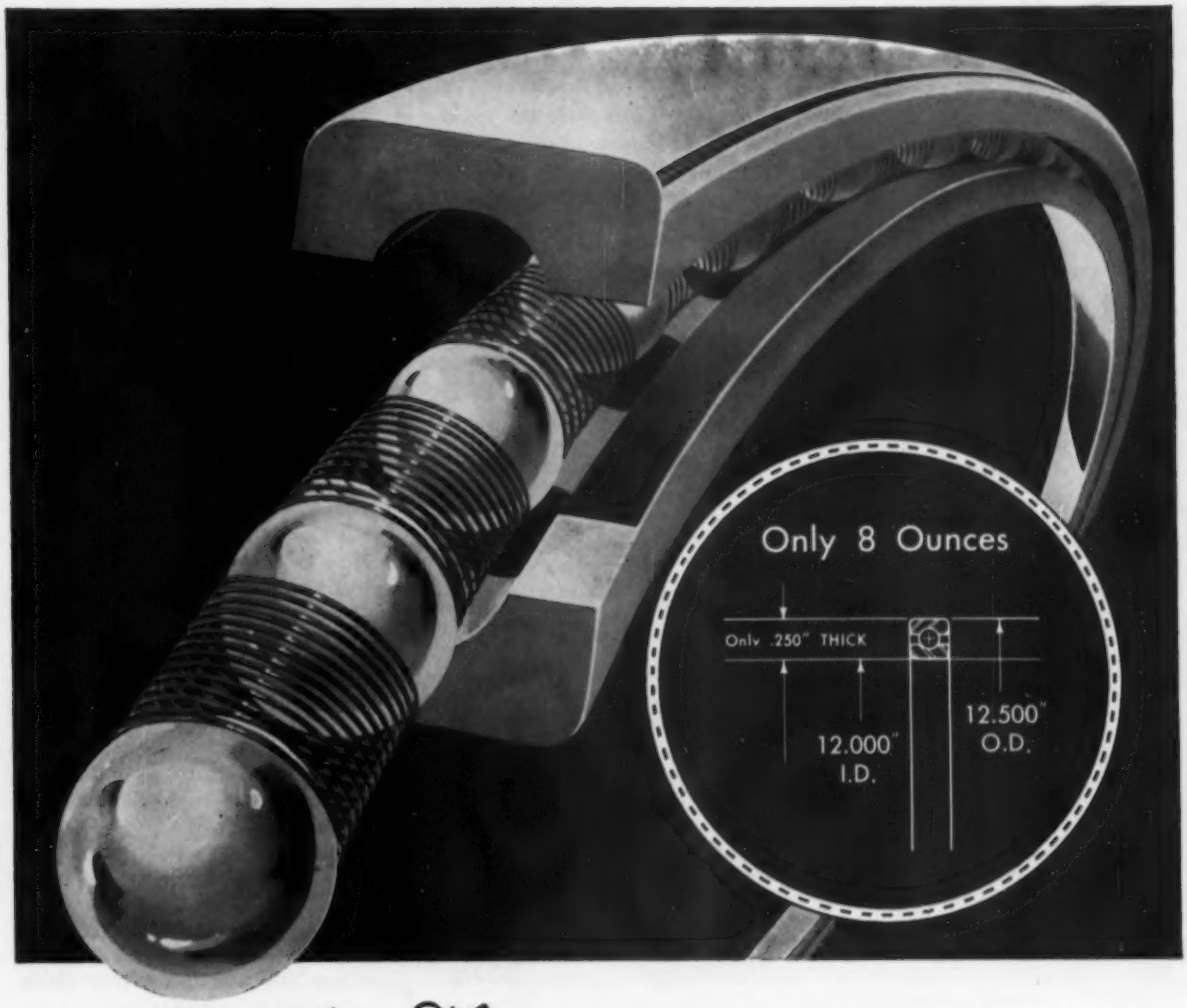
Four nuclear research reactors and their uses are described and pictured in a new bulletin. They are: G-E swimming pool reactor, water boiler reactor, heavy-water research reactor and nuclear test reactor. The bulletin also includes a list of application recommendations for all four reactors. *General Electric Co.*

For free copy circle No. 34 on postcard.

Center lapping machines

Literature is available describing Ex-Cell-O center lapping machines. Designed for use where accuracy between centers is important, these machines have the motor and precision spindle supported by a sturdy base and stout column. Work rest is adjustable for various lengths of workpieces. Lapping stone dresser is provided with the machine or an adjustable angle dresser is available if required. *Ex-Cell-O Corp.*

For free copy circle No. 35 on postcard.



Reali-Slim . . . by Kaydon
world's thinnest radial ball bearing

HERE'S a typical example of Kaydon's *Reali-Slim* unique radial ball bearing that's finding wide application in practically every industry. *Reali-Slim* are the world's finest thin-section bearings and proportionately are thinner than a wedding ring. The bearing illustrated here is 12.000" I.D., 12.500" O.D., .250" thick — weighs less than 8 ounces. Designed for minimum weight and space limitations, it has a static load capacity of 5,520 lbs. and 894 lbs. at 100 rpm.

If you're looking for *Reali-Slim*, lightweight, radial ball or roller bearings, look at Kaydon's *Reali-Slim* line. Besides hundreds of standard *Reali-Slim* designs, there's a wide variety of special races, seals and separators to meet special bearing problems. What's more Kaydon is able to produce these *Reali-Slim*, high-precision bearings because Kaydon specializes in the unusual. In addition, Kaydon bearing engineers are prepared to give you valuable help with technical bearing application problems.

For complete data on *Reali-Slim* bearings for standard or special applications, ask for engineering Catalog No. 54 RS.

***Reali-Slim* Ball Bearings** — in Conrad, angular contact, 4-point contact and other types are available in seven standard cross sections from .250" to 1" and in bore diameters from 4" to 40".

***Reali-Slim* Roller Bearings** — in radial or taper roller types are available in cross sections from 3/16" and in bore diameters from 5" to 40".

K-554

THE KAYDON ENGINEERING CORP.

MUSKEGON • MICHIGAN

All types of ball and roller bearings — 4" bore to 120" outside diameter . . .

Taper Roller • Roller Thrust • Roller Radial • Bi-Angular Roller • Spherical Roller • Ball Radial • Ball Thrust Bearings

Tap holders, drivers

A redesigned line of tap holders and drivers is described in a newly-issued bulletin. The 8-page bulletin discusses specification and application information on heavy-duty tap holders, close center tap drivers and chucks, as well as the company's line of compression and tension tap holders of the lock-and-eject type. *Scully-Jones & Co.*

For free copy circle No. 36 on postcard, p. 161

Aluminum casting unit

A 4-page folder describes the characteristics and operation of a new combination induction melting and holding furnace and automatic pouring unit for use in die casting aluminum. The folder shows photos of the unit, the Duplex Ajaxomatic, in operation, as well as an installation diagram. *Ajax Engineering Corp.*

For free copy circle No. 37 on postcard, p. 161

Gas cutting machine

Availability of a new catalog on the 6B Oxygraph Gas Cutting Machine is announced. The multiple torch machine and its accessories are described in the 12-page booklet. Illustrations show the various types of work the equipment can handle, and four types of tracer units available are described, together with gas control units and distribution systems. *Air Reduction Co., Inc.*

For free copy circle No. 38 on postcard, p. 161

Company profile

A special 75th anniversary issue of "Tinius talks" presents a comprehensive study of the company, its testing equipment and its personnel. Described with text and picture is the electronic null balance indicating system used in Olsen Universal Testing Machines and its various applications. Also discussed are the complete line of testing machines, electronic balancing machines, soil and hardness testers. *Tinius Olsen Testing Machine Co.*

For free copy circle No. 39 on postcard, p. 161

Machine tools

A condensed illustrated catalog discusses table and floor type horizontal boring mills, rotary tables, autopositioner, and 3, 4, and 5 ft radial drills. *Cincinnati Gilbert Machine Tool Co.*

For free copy circle No. 40 on postcard, p. 161

Copper base alloys

A new engineering manual on copper base alloys in rod form is now available. The 28-page booklet contains detailed information on the range of alloys produced by Mueller Brass, from the standard free-cutting variety to special alloys such as the company's 600 Series. Technical data presented includes: chemical composition of alloys, their mechanical and physical properties, machinability ratings and suitability to various fabricating processes and end uses. Corrosion resistance as well as governmental and engineering society specifications for the alloys are listed where available. *Mueller Brass Co.*

For free copy circle No. 41 on postcard, p. 161

POPE PRECISION SPINDLE

means finer finishes at lower cost

Look at the super precision double row cylindrical roller bearings and separate thrust bearings, an exclusive feature found only in Pope Spindles.

You won't find bearings like these in other makes of spindles.

The bearings and shafts in Pope Spindles have tremendous load carrying capacity for crush dressing and form grinding. They produce superior, low micro-inch finishes, and assure long, trouble-free operation. There can be *no endwise movement of shafts in either direction.* Operation is always cool. Pope System lubrication is good for the life of the bearings.

YOU CAN SPECIFY POPE SPINDLES WITH CONFIDENCE

Write for Catalog 60A covering the complete range from 1 HP to 15 HP in standard Pope Spindles.

106

Specify POPE PRECISION SPINDLES

POPE MACHINERY CORPORATION
Established 1920
261 RIVER STREET · HAVERHILL, MASSACHUSETTS

BUILDERS OF THE REVOLUTIONARY NEW POPE SUPER-PRECISION BORING MACHINE THAT BORES HOLES ROUND WITHIN MILLIONTHS OF AN INCH

FREE TECHNICAL LITERATURE

Product identifiers

Anodized aluminum Metal-Cals, for product identification, are described in a 4-page bulletin as outlasting the best decals and litho plates when it comes to weathering, salt spray resistance, humidity and abrasion. Simply applied to metal, porcelain, plastics, glass, wood, paint or enameled surfaces, they are shown in various applications. *C&H Supply Co.*

For free copy circle No. 42 on postcard, p. 161

Cleaning equipment

"How to Select the Proper Method, Machine and Material," a new booklet now available, contains technical material and over 100 illustrations helpful to industrial plants in selecting the proper methods, materials and machines for industrial cleaning. *Magnus Chemical Co.*

For free copy circle No. 43 on postcard, p. 161

Magnetic separator

An equipment bulletin and case history are available on a magnetic separator for removing ferrous metal chips and sludge from machine tool coolants. The equipment bulletin describes the separator, which employs a powerful magnetic drum to remove contamination from all water-based or mineral oil coolants. Coolant flows by gravity through separator where ferrous particles are trapped and deposited in sludge trough. Entire operation is automatic. Case history details the successful application of the equipment at a specific installation. *Houdaille-Hershey of Indiana, Inc.*

For free copy circle No. 44 on postcard, p. 161

Desiccant dryers

A complete line of desiccant type dryers for drying air, gases and liquids is described in a new 40-page bulletin. Discussed are: principal variables of dryer design and the effects of temperature and pressure on the size of dryer needed, design features and principles of operation. Flow diagrams and elevation drawings show operation of nine basic types of Kemp dryers. Engineering reference data section with charts and tables is also included. *C. M. Kemp Mfg. Co.*

For free copy circle No. 45 on postcard, p. 161

Spincraft did it for Gulf Oil...

Spincraft can do it for you!

"Marsh Buggy" travels over rugged terrain on spun aluminum wheels

another example of spinning and fabrication by Spincraft

13 DIFFERENT OPERATIONS

The "Marsh Buggy" rolls on sturdy, lightweight aluminum wheels — spun and fabricated by Spincraft. Even if all four balloon tires fail, the spun aluminum air-tight wheel drums will keep the vehicle afloat. Wheel flange segments, extensions, .118" thick 5250 aluminum stiffener ribs, No. 11 U. S. gauge (.125" thick) stainless steel front hub cones were machined and assembled to complete the wheels. In addition to spinning, Spincraft performed the following operations: welding, grinding, polishing, machining, punching, braking, drilling, tapping, sawing, riveting, assembly and testing.

WHEN Gulf Research & Development Co., a division of Gulf Oil Corp., contracted to build their world-famous "Marsh Buggy" for the U. S. Army, Gulf called on Spincraft to fabricate all four wheel assemblies.

These huge wheels are designed to bear loads of 1,500 to 4,000 lbs. Combining strength with lightweight, these tough aluminum alloy wheels can take grueling cross-country punishment. The 10-ft. dia. tires easily negotiate swamp, water, sand, deep mire and other difficult terrain, at speeds from ¼ to 40 miles per hour.

This is another example of Spincraft's versatility and manufacturing skill. Complete facilities are available for all types of contract manufacture — finished parts, assemblies and complete products. Take advantage of our modern tools for spinning and fabricating. They can pay off in savings for you, too.

Write for Spincraft data book. If you have a specific problem, tell us about it — no obligation.

WORKSHOP OF AMERICAN INDUSTRY SINCE 1919

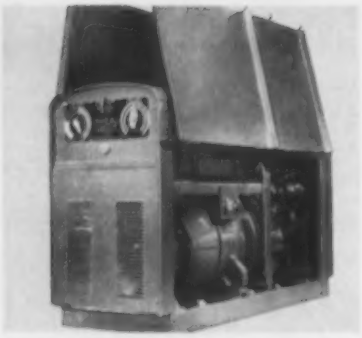
World's largest plant fully equipped for all types of metal spinning • deep drawing • stamping • fabricating

Spincraft
SKILL WILL DO IT
INCORPORATED

4140 WEST STATE STREET • MILWAUKEE 8, WISCONSIN

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 161 or 162



Diesel-driven welder weighs 20 pct less

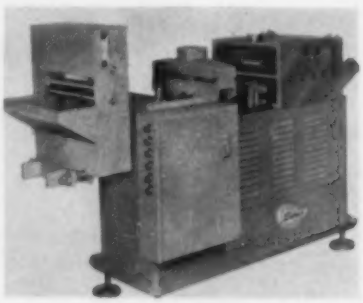
For construction, pipe line and structural welding, a new diesel-powered welder called Shield-Arc SAE-250 is rated at 250 amps at 40 v, 60 pct continuous duty cycle. The unit weighs approximately 20 pct less than a comparable 300 amp welder and is one foot shorter in length. Machine provides regulation of both voltage and amperage throughout the entire output range. Arc can be controlled as to type as well as intensity to permit efficient welding in all positions and under varying conditions of field welding. Range of the equipment is 50 to 250 amps, handling electrodes from 1/16 to ¼-in. diam. *The Lincoln Electric Co.*

For more data circle No. 46 on postcard, p. 161

Hydraulic gripper feed unit is self-contained

A self-contained, hydraulic gripper feed unit now available can be moved from one press to another and can feed into the press from right, left, front or back. It will feed stock of any width up to 20 in. or can be designed to take up to 48 in. It feeds within 0.003 in. or less of the selected setting. Function of the unit is timed by the stroke of the press ram. A hydraulic tank assembly serves as the base of the unit and as a reservoir on which other assemblies are mounted. With specially-designed gripper pads, this unit will feed stock without scratching or scuffing and to within 0.003 in. or less of the desired setting. *Sesco Inc.*

For more data circle No. 47 on postcard, p. 161



In-plant fire trucks maneuver easily

Easily-maneuverable in-plant fire trucks are available in six models to carry a wide assortment of fire-fighting equipment. Trucks employ a Kalamazoo chassis. One unit, the KB 8 Model, features a 300 lb dry chemical unit backed by a 150 gal water fog system. Other models utilize dry chemical carbon dioxide combinations, water fog/carbon dioxide combinations or solely water. Units are offered in either a 3-wheeled 42 in. wide chassis or a 4-wheeled 48 in. wide chassis for outdoor-indoor use. Various fire-fighting accessories are available. *Ansul Chemical Co.*

For more data circle No. 48 on postcard, p. 161

Machine bends rods to ¾ in. diam

A new automatic machine bends center web sections of bar joist assemblies in a single, continuous operation. Rod is fed along rail from rear, crimped over end studs and folded in a series of bender arms that work forward and close up accordion style. Finished bar is released by pneumatic cylinders as bender arms retract for next operation. Machine handles rods up to ¾ in. by 40 ft, and longer by extension. *Eidel Mfg. Co.*

For more data circle No. 49 on postcard, p. 161

10 cold-finished
JALCASE
grades
J&L
STEEL
MEMORANDUM
Here's another new book
by J+L...you'll want it for
your reference material
NOTE:
Data on J&L's Jalcase include information on the superior machinability of this cold finished steel. Both speed of machining and the amount of metal removed per revolution can be substantially higher than with other steels of approximately the same mechanical properties.
Jalcase also gives longer tool life between grindings. In many cases the machined surface of a Jalcase part requires no subsequent finishing operation.

J&L STEEL

You can help us place a copy of this *new* book in your hands. Please give us your name and address. We'll do the rest. It will be *mailed* without cost to you—no intrusion on your time.

Jones & Laughlin Steel Corp. Dept. 403
3 Gateway Center, Pittsburgh 30, Pa.

Please send me a copy of your new booklet, "10 Cold Finished JALCASE Grades."

NAME _____

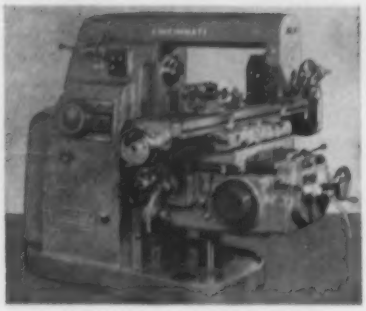
TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

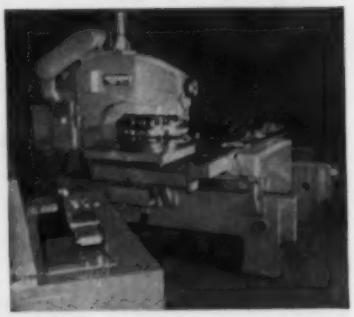


Milling machines adaptable for light metals, alloys

Recently introduced, a new line of dial type milling machines offer more power, and have a higher range of speeds and feeds than earlier models, for machining light metals as well as the newer and tougher alloys. They are built in Nos. 2, 3 and 4 sizes, and with plain, universal and vertical styles for each size. Spindle speeds range from 18 to 1800 rpm for the No. 2 size; from 16 to 1600 rpm for Nos. 3 and 4 sizes. Speeds are selected by two pushbuttons. Thirty-two feeds, ⅜ in. to 90 in. per minute, are selected with a knob. *The Cincinnati Milling Machine Co.*

For more data circle No. 50 on postcard, p. 161

Turret punch press is automatically programmed



Automatic punch presses now available are controlled by a tape-fed, electro-mechanical programming unit which automatically positions work, selects turret station carrying proper punch and die, and then trips the press. Turrets hold all punches and dies normally required for each job. Any punch or die can be replaced in 1½ to 2 minutes. The special vinyl tape used on the programming is not affected by shop oils or grease, eliminates the need for shop drawings, templates or time consuming manual layout of each hole location. *Wiedemann Machine Co.*

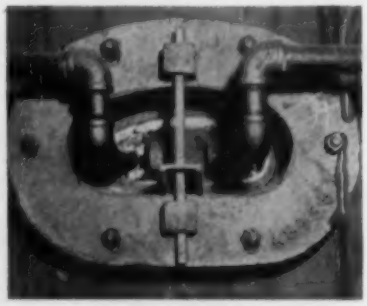
For more data circle No. 51 on postcard, p. 161

Profile recorder provides chart record

The Proficorder, a mechanical-electronic instrument, provides a magnified chart record of the profile of internal and external machined and finished surfaces. It records (1) waviness, bows, steps and other widely-spaced irregularities, with surface roughness omitted, (2) roughness irregularities alone, with waviness omitted, or (3) the combined roughness and waviness profile. Selection is made by pushbuttons on the control panel. Charts show true height and spacing of surface irregularities. All working parts are mounted on a desk-type console. Six vertical and seven horizontal magnifications are available. *Micrometrical Development Corp.*

For more data circle No. 52 on postcard, p. 161

Cooling plate holder fits all blast furnaces



An improved blast furnace cooling-plate holder permits easy removal of cooling plates for inspection or replacement. Plate is removed from outside the furnace, simply by removing water connections and flange bolts. Gas and water tight, the improved cooling plate holder is adjustable horizontally for maximum contact between brick and plates, and has an effective device for locking in the cooling plate. Unit is adjustable for use on all blast furnaces, and can be used on either welded or riveted shells. *William M. Bailey Co.*

For more data circle No. 53 on postcard, p. 161

Rotary table has 8 in. top

The Palmgren No. 86 rotary table has an 8 in. diam top with ⅝ by 1⅛ in. "T" slots crossing at the center. Center is bored for a 1½ in. locating plug. Table is graduated 360° and rotary feed is positive through worm and gear with 40:1 ration. Rotary indexing dial is calibrated in 3 minute intervals. Overall height is only 3¼ in. and the hand wheel does not extend above top or below bottom surfaces. *Chicago Tool & Engineering Co.*

For more data circle No. 54 on postcard, p. 161

A NEW KIND OF END MILL JOINS THE BROAD ILLINITE® LINE

TRI-MIL*
END MILL

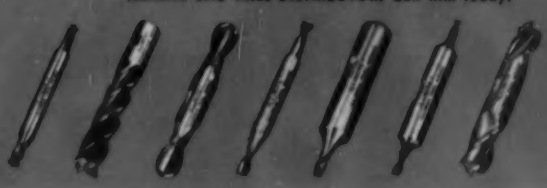
a versatile end mill with a complete range of flute lengths... in a single tool!

Here's a new end mill with cutting edges running its entire length . . . having a productive life as long as its length! The advanced adapter design permits gripping at *any* position on the mill and can be located closer to work surface for greatest rigidity.

Tri-Mil is a combination of four conventional end mills: stub length, regular length, long and extra long. It's the perfect cutting tool for every slotting operation.

Ask your Illinite distributor for this Tri-Mil brochure.

Tri-Mil and all famous Illinite End Mills are available in a full range of types and sizes from your local ILLINITE END MILL DISTRIBUTOR. Call him today!



ILLINITE OFFERS THE MOST COMPLETE LINE OF END MILLS

ILLINOIS
TOOL WORKS

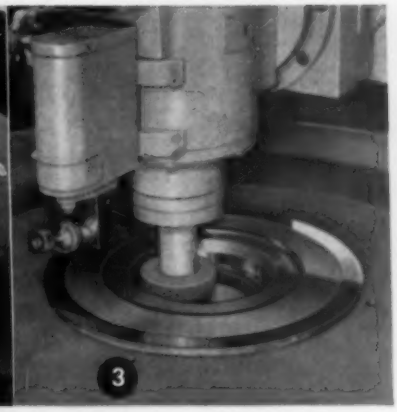
2501 N. Keeler Avenue
Chicago 39, Illinois

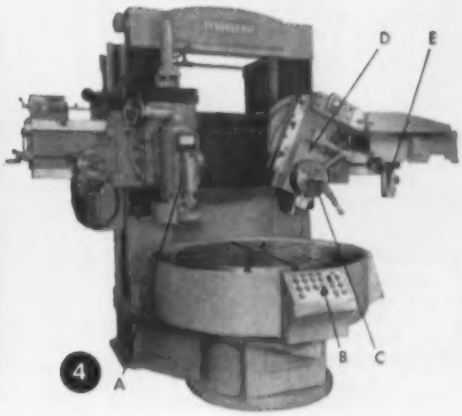
*TRADE MARK

One set-up...

...and you can turn, bore and finish grind a single workpiece to close tolerances on the NEW FRAUENTHAL SERIES 3100 TURNING AND GRINDING MACHINE.

With it, you obtain unusual machining accuracies that assure concentricity of related surfaces.





WITH the new Frauenthal Series 3100 precision turning and grinding machine you get accuracies previously considered impractical.

Designed to meet the most exacting requirements of jet engine manufacture as well as other precision applications, the Series 3100 machine is new from the ground up. Its unique design presents a host of opportunities to put large and extremely close-tolerance jobs on a mass production basis. And the 3100 offers exceptional capacity for precision turning and precision grinding.

Check these salient features

- Ultra-precision work table bearings
- Hydraulically actuated turning slide
- Hydraulically actuated grinding slide
- Super precision grinding spindle
- Conveniently located controls and safety switches

. . . and this optional equipment

- Hydraulic tracer control
- Electronic table surface speed control
- Hydraulic wheel dressers for varied applications

Frauenthal Division

THE KAYDON ENGINEERING CORP.
MUSKEGON, MICHIGAN

...about the pictures

PHOTO 1 shows how the operator uses a Series 3100 machine to finish bore the inside diameters preparatory to grinding operations.

PHOTO 2 shows the machine's contouring attachments being used to face the top surfaces of a workpiece.

PHOTO 3 shows how the machine performs close-tolerance finish grinding of the workpiece's top surfaces and inside diameter, to assure concentricity and squareness of related surfaces.

PHOTO 4 illustrates (a) grinding spindle with graduate swivel mounting, (b) push-button control panel, (c) five-station tool turret, (d) hydraulic actuated turning slide, (e) hydraulic tracer control (optional).

May we help you?

If you'd like further information on how the Series 3100 precision turning and grinding machine can give you production and/or tool room advantages — our engineers are at your service. Write for informative bulletin No. 301.

DRILLS 7% MORE GRAY IRON VALVE BODIES PER SHIFT

...thanks to

FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE... because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 41, Niagara Falls, N.Y. 44-01

CARBORUNDUM®

Metal Stamping Facilities

by Lansing

at your Service for...

ELECTRICAL EQUIPMENT

HOUSEHOLD APPLIANCES

TRANSPORTATION EQUIPMENT

INDUSTRIAL EQUIPMENT

FARM IMPLEMENTS

Lansing Stamping Co.

ESTABLISHED 1914

LANSING 2 MICHIGAN

Cut-off machine

Fully-automatic, a new Model M-16 nonferrous metal cut-off machine has an automatic feed for bar stock and turns out work with a milled-like finish. It can be set up

to cut any desired lengths. Production rate, for one firm cutting brass solids of 1 in. cross sectional area into ⅝ in. pieces, is 12,000 pieces per 8-hour day. Tolerances were reported held to under .005 in. A larger Model M-75 machine for ferrous metals uses an abrasive cut-off wheel. *Stone Machinery Co., Inc.*

For more data circle No. 55 on postcard, p. 161

Gas-fired oven

An oven with temperature control adjustable from 100°F to 1000°F, gas-fired, is available for such operations as burning off old insulation on electric motors and baking on new enamel. Size of work space is 26-in. by 30-in. by 30-in. deep. Five inches of rockwood insulation are used between inner and outer steel shells. Drip pan may be taken

out while oven is in operation for cleaning. The oven can also be built for heating electrically, and can be supplied in other sizes and specifications. *Grieve-Hendry Co., Inc.*

For more data circle No. 56 on postcard, p. 161

Cylindrical grinder

The new type CMS-1 semiautomatic multi-wheelslide cylindrical grinding machine is a special purpose grinder which can be adapted to a wide range of cylindrical grinding operations. Principle advantage is the ability to plunge grind multiple diams simultaneously on workpieces which, because of their shape, do not lend themselves to grinding on conventional multi-wheel machines. Wheelsides, positioned during manufacture for specific job requirements, may be op-

posed or placed in line. Provision is made for slight angular or lateral adjustment of position for setup purposes. *Morton Co.*

For more data circle No. 57 on postcard, p. 161

Acetate visors

A clear acetate visor gives excellent frontal and side face protection against abrasive particles, flying objects and chemical splashes. It

can be attached to any M-S-A protective hat without marring the hat and can be (nstalled or removed in seconds. *Mine Safety Appliances Co.*

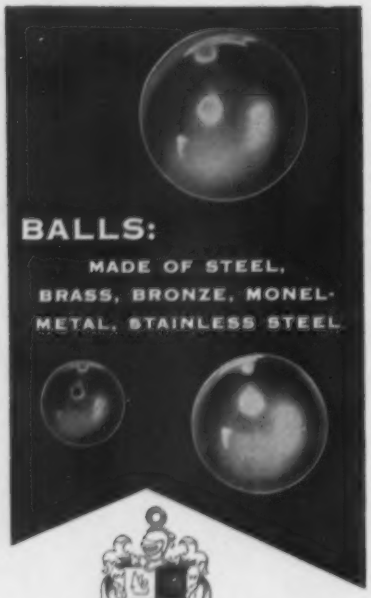
For more data circle No. 58 on postcard, p. 161

Mighty Mammoth

This huge Planer Type Milling Machine embodies the highest accuracy standards for which GRAY is world famous. Its great precision is coupled with brute power, hogging capacity. A host of new GRAY features make this mighty mammoth a miracle of modern milling. Great simplicity of control with unique unit head versatility are further reasons why

Quality doesn't cost . . . it pays.

The G. A. GRAY Co., Cincinnati, Ohio



HOOVER

The Aristocrat of Bearings

BALL BEARINGS:
AMERICA'S ONLY BALL BEARING WITH HONED RACEWAYS

HOOVER BALL AND BEARING COMPANY
ANN ARBOR, MICHIGAN

Drill presses

New 21-in. sliding head floor drills are available with a round or box column, the latter offered in multi-spindle arrangements. Drills are supplied with geared power feed as standard equipment. A simple selector is used to obtain any of four rates of feed which are engaged

through a positive-jaw clutch. Entire power feed mechanism is housed in the head. A No. 4 Morse taper spindle is standard, with a No. 3 Morse taper spindle optional. *Cincinnati Lathe & Tool Co.*

For more data circle No. 59 on postcard, p. 161

Motor speed controls

Designed to deliver stepless motor speed control from "dead stop" to "above base speed," a new line of DC motor speed controls is available. Motor speed is set by the operator, thereafter remains constant within 2 pct despite line and load variations. Speed sensing element is the Regohm, a high-gain finger type regulator. No electronic tubes are used in these controls. *Electric Regulator Corp.*

For more data circle No. 60 on postcard, p. 161

Hyde Park
RED CIRCLE Rolls ALLOY-CHILLED

Gray Iron Castings

Hyde Park Castings up to 80,000 pounds are sound, accurate and physically dependable.
Precision machining is done by skilled craftsmen in our modern machine shop.
Send your blue prints for quotation.

Mill Drive

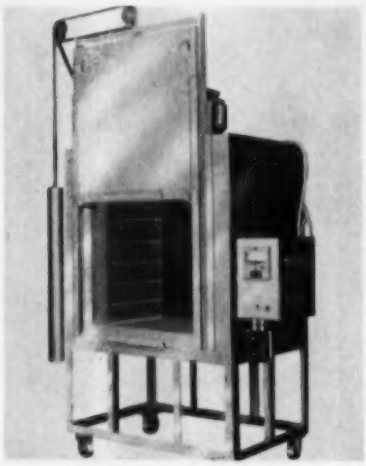
Machine Castings
Lathe Beds
Housings
Pinion Housings
Mill Housings
Shoe Plates
Layout Plates
Surface Plates

For finer finish, long life and greater tonnage, specify Red Circle Rolls.

Hyde Park
FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa
ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

Recirculating ovens

Mobility, diagonal air flow and exact control of temperatures to 1000 F are features of new Temp-O-Loy automatic forced air recirculating ovens, designed for preheating and stress relieving of magnesium, aluminum and the newer alloys. Ovens are available



in two standard sizes of 18 and 36 cubic ft working space, for either 230 or 440 v single or 3-phase operation. *Blue M Electric Co.*

For more data circle No. 61 on postcard, p. 161

Constant-voltage welders

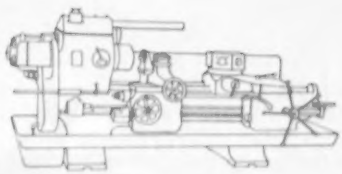
A new line of 500-, 750-, and 1200-amp constant-voltage welders permits the operator to select the arc voltages he desires, then merely set the correct rod feed and travel rate to get the desired deposit rate. The constant voltage feature insures that the deposit is uniform; arc voltage, rod speed and travel rate all remain constant. Efficiency of 85 pct or better is claimed for the units. *Harnischfeger Corp.*

For more data circle No. 62 on postcard, p. 161

LET SIMMONS REBUILD AND MODERNIZE YOUR TURRET LATHES

Investigate the important production, maintenance and tax savings of SIMMONS ENGINEERED REBUILDING for your: Lathes, Planers, Surface Grinders, Cylindrical Grinders, Vertical Millers, Openside Planers, Automatics, Vertical Boring Mills, Turret Lathes and Radial Drills.

A qualified Simmons rebuilding engineer will discuss it with you. Write, wire or phone today. Simmons Machine Tool Corporation, 1721 North Broadway, Albany 1, N. Y.



Write for Simmons Way... case histories of rebuilding jobs.

SIMMONS GIVES MACHINE TOOLS A NEW LEASE ON LIFE

Unconditional guarantee...our standard since 1910

"It's an emergency! Go to Columbia's warehouse and pick up our order for ATMODIE SMOOTHCUT!"

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.

Producers of fine tool steels — All types immediately available through Sales Offices, Warehouses and Representatives in Principal Cities.

TOOL COLUMBIA STEELS

Electro
MANGANESE
99.9+%
STANDARD OF THE WORLD FOR PURITY
Write for pamphlet
Electro
MANGANESE
CORPORATION
BOX 479 KNOXVILLE, TENNESSEE

STAMPINGS
for the FINISHED PRODUCT

SEE SESSIONS . . . for Metal Specialties, Box & Case Hardware, Stamped Assemblies in a wide range of finishes.

J. H. SESSIONS & SON

290 RIVERSIDE AVENUE • BRISTOL, CONN.

Improved gate valve

An all new gate valve provides impenetrable line shutoff, both on the upstream and downstream side of the wedge. Besides precision metal-to-metal contact of the wedge

and valve body seats, the gate valve incorporates a pair of Teflon packing seals which press dead-tight against the wedge, forming an impassable seal. *Hammer Valves, Inc.*

For more data circle No. 63 on postcard, p. 161

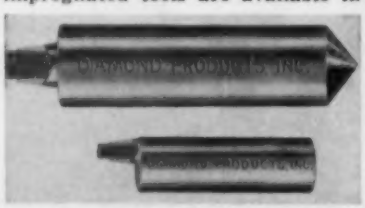
Adjustable-speed motor

Improved variable-speed induction motors are completely self-contained, and apply the Schrage principle for stepless control from zero to 2400 rpm, with torque approximately constant at all speeds. Ratings range from ½ to 75 hp, for 220 or 440 v operation. *ACEC Electric Corp.*

For more data circle No. 64 on postcard, p. 161

Diamond tools

Designed specifically for dressing thread grinding wheels, diamond-impregnated tools are available in



all types of holders for thread grinding machines that grind sharp "V" or straight-line threads. The protruding diamond impregnated matrix offers a cutting face in any direction. *Diamond Products, Inc.*

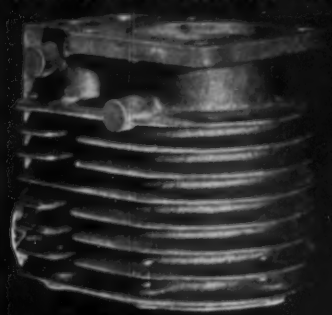
For more data circle No. 65 on postcard, p. 161

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

USER SAYS TAP LIFE UP 43% ON THIS THIN-WALLED CASTING



. . . thanks to
FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE . . . because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 46, Niagara Falls, N.Y. 60-68

CARBORUNDUM®

LOVEJOY

Variable SPEED PULLEYS

SELECT-O-SPEED TRANSMISSIONS

Save You Money

HERE'S WHY:

- ECONOMICAL IN COST compared to other variable speed transmission equipment. Simple in design but rugged in construction to give you long dependable service.
- EASILY INSTALLED on new or old equipment. Just as easy to operate. Finger-tip adjustment gives the right speed instantly.
- MAINTENANCE IS NEGLIGIBLE. No complicated mechanisms to get out of order. All parts can be readily inspected. Belts can be quickly adjusted or replaced.

Lovejoy Variable Speed Pulleys

are available in a complete range of sizes from fractional to 15 hp., ratios to 3 to 1.

Shown is a typical Lovejoy countershaft unit controlling speed of automatic spring coiler.

Lovejoy Select-O-Speed Transmissions

can be supplied with hand wheel or lever control. Fractional to 5 hp., ratios to 10 to 1.

This Lovejoy Select-O-Speed is used to control the speed of a printing press.

For your variable speed application, there is a type and size Lovejoy unit that will give you initial economy, dependable performance and long service life.

GET FULL DETAILS NOW!

Request Catalog

LOVEJOY FLEXIBLE COUPLING CO.

4866 W. LAKE STREET • CHICAGO 44, ILLINOIS

Mfrs. of Flexible Couplings, Variable Speed Pulleys and Transmissions, Motor Bases and Universal Joints.

Fork lift trucks

Available in 32,000-lb, 36,000-lb and 40,000-lb capacities, "H" Series fork lift trucks provide important economies in moving steel or concrete pipe, lumber, or other

materials that handle more profitably in oversize loads. *Gerlinger Carrier Co.*

For more data circle No. 66 on postcard, p. 161

High pressure hose

High pressure hose, available in ⅜, ½ and ¾-in. sizes, will perform satisfactorily at 5000 psi operating pressures in the ⅜-in. size, proportionately more in larger

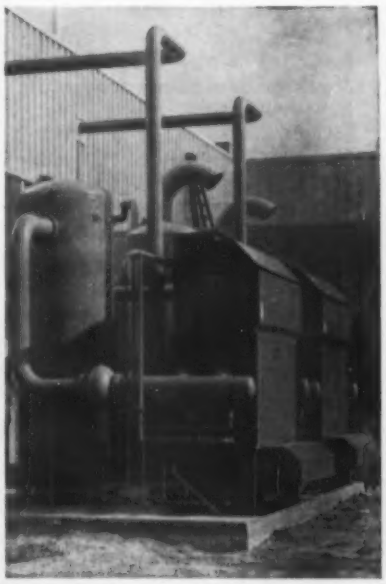
sizes. The hose will withstand surge pressure 15 to 20 pct higher than the company's standard high pressure hoses. *Aeroquip Corp.*

For more data circle No. 67 on postcard, p. 161

Spray washer compounds

New mechanical spray washing compounds for cleaning ferrous and non-ferrous metals have been developed. Detrex 58, for ferrous metals, has sequestering agents for overcoming hard water conditions and to assist in removing hard water scale without foaming. Detrex 59 is for cleaning non-ferrous metals such as brass and aluminum, and is a highly buffered product which eliminates etching and reduces tarnish. *The Detrex Corp.*

For more data circle No. 68 on postcard, p. 161



This Niagara Aero After Cooler also cools compressor jacket and intercooler water.

COMPRESSED AIR
• Lower in Cost
• Drier and Cooler

THE NIAGARA *AERO* AFTER COOLER offers a completely self-contained method replacing both shell-and-tube cooler and cooling tower. It is independent of a large supply of cooling water and consistently reduces compressed air temperatures to below ambient.

Drier air gives you better operation and lower costs in using all air-operated automatic instruments, tools and machines, paint spraying, sand blasting and moisture-free air cleaning.

Direct saving in the cost of cooling water saves the price of the Niagara *Aero* After Cooler in less than two years.

Niagara *Aero* After Cooler assures all these benefits because it cools compressed air or gas below the temperature of surrounding atmosphere; there can be no further condensation in your air lines. It condenses the moisture by passing the air through a coil on the surface of which water is evaporated, transferring the heat to the atmosphere. It is installed outdoors, protected from freezing in winter, proven in service on the largest plant utility systems.

Write for Bulletin No. 130

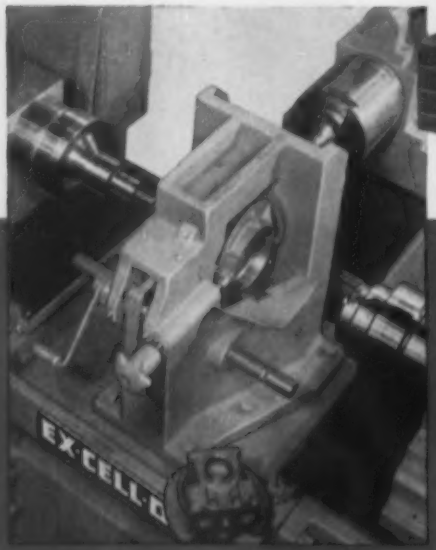
NIAGARA BLOWER COMPANY

Dept. I.A., 405 Lexington Ave.
NEW YORK 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

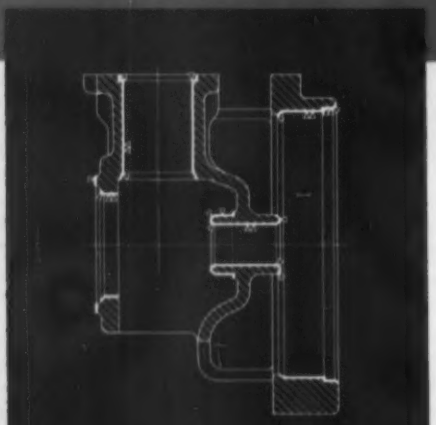
Ex-Cell-O 3-Way Precision Boring Machine. Standard way units—tooled to suit the work.

Note the simplicity of this tooling.



Cut Costs—Combine Operations

. . . INSURE YOUR PROFITS in Today's Competitive Market



Heavy lines show the machined surfaces. Small single triangles indicate single operations; double triangles indicate rough-and-finish operations.

Once a part is properly located and clamped, it's good practice to do as much machining on it as possible before it's moved! Related dimensions are held closer, handling time minimized and production increased.

This Ex-Cell-O 3-Way Precision Boring Machine performs 5 roughing and 18 finishing operations on a cast-iron crankcase used in the refrigeration industry. Tolerances are extremely close on the crankshaft and cylinder bores. Net production for the roughing operation is 33 parts per hour; for finishing, 36 parts per hour.

Ask your local Ex-Cell-O representative about all the other advantages of Ex-Cell-O Way Machines—or write today for Bulletin.

XLO
EX-CELL-O Air PRECISION

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

55-44

The Iron Age SUMMARY . . .

Desperate consumers are making barter deals . . . High-cost conversion arrangements mounting . . . Consumer production lines cut back . . . New orders climbing

Trying Another Tack . . . Steel consumers are turning to the ancient system of barter in a desperation move to keep production lines going. It's another indication of the growing emergency in steel.

Many companies have assigned special task forces to ferreting out odd lots of steel that another consumer is willing to trade. The deals involve steel-for-steel or steel for any other commodity that happens to fit the picture.

The mills are frankly worried about the way things are going. Consumers are even more jittery. High-cost conversion arrangements are mounting. More would be made if excess rolling mill space could be found.

Conversion deals in the making, or making the rounds, involve sheets, plates, and even bars. At least 10,000 tons of sheet conversion involving two large Midwestern manufacturers are being sought. Another large firm has done some plate conversion. Still another consumer is reported checking for bar conversion space.

Shortage Really Hurts . . . For some consumers, lack of steel has reached the point where production line cutbacks have been necessary. For others, offers of new business are being turned down due to the precarious outlook for future steel supply.

The mills are up against it. Despite the record production pace of recent weeks, new business is exceeding output. And it's a question how long producers can maintain present levels.

Steelmaking furnaces and rolling mills obviously are being pushed to the hilt. But a day of reckoning is coming. Maintenance shutdowns, wildcat strikes, and other unforeseen emergencies assume more significance today than they normally would.

There's little chance of a letup in pressure in the next seven months. All major industries are going all out to (1) get steel for present requirements, and (2) to rebuild depleted inventories.

Freight Program Suffers . . . It's estimated that the freight car program alone would require 2.5 million tons of steel ingots to keep production lines operating at capacity. But there isn't enough steel available to support the program. And that means a continuing shortage of shipping space for months to come.

The steel industry will add up to 12 million tons of new capacity over the next 3-to-4 years, at a cost of something like $2.4 billion or more.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,400	2,400	2,328	1,895
Ingot Index				
(1947-1949=100)	149.5	149.5	144.7	117.7
Operating Rates				
Chicago	98.0	98.5	96.5	81.5
Pittsburgh	103.0	102.0*	101.0	76.0
Philadelphia	103.0	103.0	98.0	68.5
Valley	99.0	98.0*	97.0	74.0
West	96.0	100.0*	75.0	79.5
Detroit	95.0	94.0	98.0	100.0
Buffalo	105.0	105.0	105.0	95.5
Cleveland	100.0	104.0*	105.0	80.0
Birmingham	94.0	94.0	97.5	64.0
S. Ohio River	92.0	92.0*	89.0	85.0
Wheeling	102.0	101.0	103.0	96.0
St. Louis	97.0	106.0	106.0	87.0
Northeast	97.0	72.0	83.0	51.0
Aggregate	99.5	99.5	96.5	78.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.174	5.174	5.174	4.798
Pig Iron (Gross Ton)	$59.09	$59.09	$59.09	$56.59
Scrap, No. 1 hvy (gross ton)	$44.83	$44.50	$44.17	$34.00
Nonferrous				
Aluminum ingot	24.40	24.40	24.40	22.20
Copper, electrolytic	43.00	43.00	43.00	30.00
Lead, St. Louis	15.30	15.30	15.30	14.80
Magnesium, ingot	33.25	33.25	33.25	27.75
Nickel, electrolytic	64.50	64.50	64.50	63.08
Tin, Straits, N. Y.	96.375	96.625	92.25	90.625
Zinc, E. St. Louis	13.00	13.00	13.00	11.50

STEEL PRODUCT MARKETS

Pinch on Hot-Rolled Sheets

Some mills cut first quarter bookings . . . Hot-rolled sheets are diverted to galvanized or other products . . . Steel shipments set record for first three quarters.

◆ IT LOOKS like consumers of hot-rolled sheets are in for some tough sledding. At least three hot-rolled sheet suppliers have eliminated or reduced order intake for first quarter of 1956. This means they want to convert more hot-rolled into cold-rolled for various reasons, including a better profit margin. One producer plans to use his hot-rolled output for a new galvanizing line starting up in first quarter.

A Northern Ohio appliance firm purchasing agent says he has been notified by his two principal hot-rolled sheet suppliers that they are unable to accept any business for first quarter. A third will continue to supply the firm on a reduced tonnage basis until other arrangements can be made.

With the availability of hot-rolled sheets thus reduced, the scramble for this product will be as tough as it has ever been.

The outlook for plates grows dimmer with announcement by National Tube Div. of U. S. Steel Corp. of a firm commitment to supply 34-in high-pressure steel pipe for the western leg of the 2300-mile Trans-Canada Pipe Lines, Ltd. gas pipe line project. Deliveries will begin in February and continue into late-summer of '56. Much of this pipe line will be in electricweld, made from plate.

American Iron and Steel Institute announces that shipments of finished steel products during September were the highest in history—7.4 million tons. During nine months of this year, steel shipments totaled 62.7 million tons, also a record.

September shipments exceeded the previous record for that month, set in 1952, by more than 836,000 tons. During first three quarters, shipments were 32 pct greater than the 45.7 million tons shipped during the same period last year and about 824,000 tons more than the previous nine-months record set in 1953.

SHEETS AND STRIP . . . Estimated carryovers of 60 to 90 days in **Chicago** by the end of first quarter '56 will be corrected, at least on the books, by March, some mills feel. But some customers are doubtful about this point. One large consumer is reported trying to swing a conversion deal on sheet. It's expected that capacity operations on both hot and cold-rolled sheet will continue through first half. First to second quarter carryovers are looked for—if automakers continue to buy up sheet at present heavy pace. A large **eastern** producer is setting up a month-to-month order pattern on most products for first quarter, is trying out the system to help better determine carryover periods, expected delays in deliveries. Right now, average deliveries on most "hot demand" items are running behind 2 to 5 weeks. Shapes are tightest at 6 to 7 weeks. Hot-rolled sheet is a popular warehouse item in **Cleveland**, with most warehouses reporting good stocks on hand. Demand for cold-rolled sheet, especially from Detroit, is heavy. It's estimated that about 80 pct of sheet tonnage is now going into Detroit and Lower Michigan by truck. Demand in **Detroit** for sheet will hold at very heavy levels through March, won't get any better until June. **Pittsburgh** mill deliveries are still running 10 weeks behind. Warehouse stocks are in bad shape, can't help customers much.

BARS . . . Pressure for carbon bar in **Detroit** is keeping up at an unrelenting pace. Biggest customer is automotive. Look for carryovers on hot-rolled bar of 6 to 8 weeks in **Chicago.** There are rumors of potential conversion which suggests that consumers expect demand to show little easing in first quarter. Where order books have been opened, mills are already sold out for first quarter. In the **East,** a leading producer is taking carbon bar orders for the month of January only. Deliveries are running 2 to 3 weeks in arrears. Another large producer has yet to open his books on bar for first quarter.

PLATE . . . Conversions in one-quarter inch and lighter plate are reported from **Chicago.** The wave of new railroad car orders in the past month will add a further drain on this already-tight item. Plate orders for next quarter in the **East** are being carefully scanned right now. Most big producers haven't opened order books yet, will do so shortly.

STRUCTURALS . . . From **Pittsburgh** comes word that it will be at least second quarter '56 before any new structural tonnage is available to consumers. In the **East,** several major producers are still shying from opening first quarter order books. When books do open, probably shortly, carryovers will run around 6 to 7 weeks.

WIRE PRODUCTS . . . Demand in **Chicago** is keeping wire booked solidly through first quarter. There will even be some carryovers running as high as four weeks into first quarter. Nails, staples are having a good year as far as shipments are concerned. Manufacturers wire is running at capacity clip. Spring wire and other manufacturers wire grades are extremely tight in **Detroit.** Carryovers going into early next year are expected to be substantial.

Purchasing Agent's Checklist:

INDUSTRY: What's the outlook for U.S. shipbuilders? . . . . . p. 67

PROBE: Congress takes a long look at General Motors . . . . . p. 70

SYSTEMS: Bolt and nut manufacturers simplify pricing system p. 71

ZINC: Shipments will hit a record 1 million tons this year . . . . . p. 72

FREIGHT: Air shipments are climbing, metalworking items lead way . . . . . p. 74

Comparison of Prices

(Effective Nov. 8, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Nov. 8 1955	Nov. 1 1955	Oct. 11 1955	Nov. 9 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.325¢	4.325¢	4.325¢	4.05¢
Cold-rolled sheets	5.325	5.325	5.325	4.95
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.45
Hot-rolled strip	4.325	4.325	4.325	4.05
Cold-rolled strip	6.29	6.29	6.29	5.82
Plate	4.52	4.52	4.52	4.225
Plates wrought iron	9.30	9.30	9.30	9.30
Stainl's C-R strip (No. 302)	44.50	44.50	44.50	41.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) coke	$9.05	$9.05	$9.05	$9.05
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.75
Special coated mfg. ternes	7.85	7.85	7.85	7.85
Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.30¢
Cold finished bars	5.90	5.90	5.90	5.40
Alloy bars	5.65	5.65	5.65	5.075
Structural shapes	4.60	4.60	4.60	4.25
Stainless bars (No. 302)	38.25	38.25	38.25	35.50
Wrought iron bars	10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire	6.25¢	6.25¢	6.25¢	5.75¢
Rails: (per 100 lb.)				
Heavy rails	$4.725	$4.725	$4.725	$4.45
Light rails	5.65	5.65	5.65	5.35
Semifinish Steel: (per net ton)				
Rerolling billets	$68.50	$68.50	$68.50	$64.00
Slabs, rerolling	68.50	68.50	68.50	64.00
Forging billets	84.50	84.50	84.50	78.00
Alloy blooms, billets, slabs	96.00	96.00	96.00	86.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.025¢	5.025¢	5.025¢	4.675¢
Skelp	4.225	4.225	4.225	3.90
Finished Steel Composite: (per pound)				
Base price	5.174¢	5.174¢	5.174¢	4.798¢

	Nov. 8 1955	Nov. 1 1955	Oct. 11 1955	Nov. 9 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$63.69	$63.69	$63.69	$61.19
Foundry, Valley	59.00	59.00	59.00	56.50
Foundry, Southern, Cin'ti	62.93	62.93	62.93	60.43
Foundry, Birmingham	55.00	55.00	55.00	52.88
Foundry, Chicago	59.00	59.00	59.00	56.50
Basic, del'd Philadelphia	62.77	62.77	62.77	60.27
Basic, Valley furnace	58.50	58.50	58.50	56.00
Malleable, Chicago	59.00	59.00	59.00	56.50
Malleable, Valley	59.00	59.00	59.00	56.50
Ferromanganese†, cents per lb.	9.50¢	9.50¢	9.50¢	9.50¢
† 74-76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$59.09	$59.09	$59.09	$56.59
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$45.50	$44.50	$44.50	$35.50
No. 1 steel, Phila. area	46.50	46.50	46.50	33.00
No. 1 steel, Chicago	42.50	42.50	43.50	33.50
No. 1 bundles, Detroit	39.00	39.00	39.00	26.50
Low phos., Youngstown	49.00	49.00	49.00	35.50
No. 1 mach'y cast, Pittsburgh	50.50	50.50	48.50	42.50
No. 1 mach'y cast, Philadel'a	48.50	48.50	47.50	42.50
No. 1 mach'y cast, Chicago	53.50	52.50	53.50	42.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$44.83	$44.50	$44.83	$34.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$13.25	$14.38
Foundry coke, prompt	16.25	16.25	16.25	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	43.00	43.00	43.00	30.00
Copper, Lake, Conn.	43.00	43.00	43.00	30.00
Tin, Straits, New York	96.375	96.625	96.25	90.625
Zinc, East St. Louis	13.00	13.00	13.00	11.50
Lead, St. Louis	15.30	15.30	15.30	14.80
Aluminum, virgin ingot	24.40	24.40	24.40	22.20
Nickel, electrolytic	64.50	64.50	64.50	62.08
Magnesium, ingot	33.25	33.25	33.25	27.75
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.50
† Tentative. ‡ Average. ° Revised.				

Finished Steel Composite
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite
Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 192→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	60.50	61.00	61.50	62.00	.....
Birdsboro, Pa. *B6*	60.50	61.00	61.50	62.00	.....
Birmingham *R3*	54.50	55.00°	.....	.....	.....
Birmingham *W9*	54.50	55.00°	59.00	.....	.....
Birmingham *U4*	54.50	55.00°	59.00	.....	.....
Buffalo *R3*	58.50	59.00	59.50	.....	.....
Buffalo *H1*	58.50	59.00	59.50	.....	.....
Buffalo *W6*	58.50	59.00	59.50	60.00	.....
Chester *C17*	60.50	61.00	61.50	.....	.....
Chicago *I4*	58.50	59.00	59.00	59.50	.....
Cleveland *A5*	58.50	59.00	59.00	59.50	63.50
Cleveland *R3*	58.50	59.00	59.00	.....	.....
Duluth *I4*	58.50	59.00	59.00	59.50	.....
Erie *I4*	58.50	59.00	59.00	59.50	.....
Everett *M6*	.....	61.00	61.50	.....	.....
Fontana *K1*	64.50	65.00	.....	.....	.....
Geneva, Utah *C7*	58.50	59.00	.....	.....	.....
Granite City *G2*	60.40	60.90	61.40	.....	.....
Hubbard *Y1*	.....	.....	59.00	.....	.....
Lone Star *L3*	.....	55.00	.....	.....	.....
Minnequa *C6*	60.50	61.00	61.50	.....	.....
Monessen *P6*	58.50	.....	.....	.....	.....
Neville Is. *P4*	58.50	59.00	59.00	.....	.....
N. Tonawanda *T1*	.....	59.00	59.50	.....	.....
Pittsburgh *U1*	58.50	.....	.....	59.50	.....
Sharpsville *S3*	58.50	59.00	59.00	59.50	.....
So. Chicago *R3*	58.50	.....	59.00	.....	.....
Steelton *B3*	60.50	61.00	61.50	62.00	66.50
Swedeland *A2*	60.50	61.00	61.50	62.00	.....
Toledo *I4*	58.50	59.00	59.00	59.50	.....
Troy, N. Y. *R3*	60.50	61.00	61.50	62.00	66.50
Youngstown *Y1*	.....	.....	59.00	59.50	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel. °Add $1.00 for 0.31-0.89 pct phos.

Silvery Iron: Buffalo, *H1*, $68.75; Jackson, *J1*, *G1*, $67.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	17.75	19.00	—	20.25	31.50	25.00	33.75	15.00	—	15.25
Slabs, billets, rerolling	22.25	24.75	26.75	26.00	40.25	32.00	43.00	19.50	—	19.75
Forg. discs, die blocks, rings	—	—	—	—	—	—	—	—	—	—
Billets, forging	31.75	32.00	34.75	33.75	51.25	38.25	51.00	25.50	26.00	26.00
Bars, wires, structurals	38.00	38.25	41.00	40.25	60.75	45.25	60.00	30.50	31.00	31.00
Plates	40.00	40.25	42.75	43.00	64.00	49.25	64.75	31.75	33.00	32.25
Sheets	44.25	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75
Strip, hot-rolled	32.00	34.50	—	37.25	58.25	44.25	59.75	—	—	—
Strip, cold-rolled	41.00	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2*, *J3*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4* Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U5* (.25¢ per lb higher); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

Bar: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U7*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R5*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A5*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Farndale, Mich., *A3*; Washington, Pa., *J2*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J3*; McKeesport, *F1*; Massillon, Canton, O., *R3* Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*.

Pittsburgh Takes the Spotlight

No. 1 heavy melting $1 price rise in Pittsburgh highlights week's market . . . Chicago shows advances in cast, specialties . . . Composite moves up to $44.83.

◆ A $1 RISE in the price of No. 1 heavy melting steel in Pittsburgh highlighted the week's market activity.

The upward turn in the top steelmaking grade came on a purchase by a fringe consumer. By the same token, No. 2 heavy melting and No. 2 bundles took a $1 dip. An upward movement in the see-saw play is reflected further down the list in the price on No. 1 machinery cast, up $1 over last week's listing.

Chicago prices, holding firm at earlier levels in most grades, showed some additional strength in scattered sales in specialties and cast. There is some evidence of "long" buying on the part of brokers in expectation of price advances within the next 10 days.

Cast grades are the merchandise to watch in both Philadelphia and New York. The former market reflected another $1 rise in cupola cast on the basis of a representative purchase by a leading area consumer.

Lack of activity in blast furnace grades was reflected in another drop of 50¢ in Detroit. Some observers feel the price may even go lower once the water shipping season ends.

THE IRON AGE Composite for No. 1 heavy melting steel scrap, reflecting the upward movement in Pittsburgh, rose 33¢ to $44.83.

Pittsburgh . . . Local market for openhearth scrap is quiet but No. 1 heavy melting went for about $1 above local delivery price on a purchase by a fringe consumer. On the same basis, No. 2 heavy melting and No. 2 bundles were off $1 a ton. A local consumer purchased a tonnage of low phos scrap at $50 a ton, in line with current prices. Reflecting the increased foundry activity in the area, No. 1 machinery cast advanced another dollar a ton. Other grades are stable and unchanged.

Chicago . . . The Chicago market continued to inch up though bellwether grades continued to hold to present price levels. Scattered sales in specialties and cast, however, at strong prices, indicated the underlying strength of all grades. Broker buying prices have not advanced generally but there is evidence of "long" buying in expectation of price advances within the next 10 days. Railroad grades are expected to lead the advance. Coupled with a general wave of optimism was Chicago's first severe cold wave which can be expected to slow deliveries over the next week.

Philadelphia . . . Top steelmaking, blast furnace, and railroad specialties continue to hold steady and strong at earlier levels. Additional firmness was added to the already strong cast market with the purchase by a leading consumer of cupola cast at $1 higher than the earlier going price. Export activity is reported at a good clip with an outbound ship expected to begin loading shortly. Dealers note some slowdown of inbound yard traffic, report demand is steady, look for little change in market activity until at least the end of the month.

New York . . . Cast grades are the merchandise to watch in this market. The trade is virtually unanimous that any sizable new orders will have to be at higher prices, but no new sales have been rung up at press time. Other grades continue to move well, with supplies tight but not yet critical. Exports continue to be a firm prop in this area, but there is some talk of curtailment in the near future to take care of domestic business.

Detroit . . . A local mill bought No. 1 bundles on a $39.50 fob basis last week and the market is holding steady with the exception of blast furnace grades. Lack of activity in borings and turnings was reflected in another drop of 50¢. Market observers believe the price may even go lower once the water shipping season ends. Other grades are expected to remain steady at least through November.

Cleveland . . . Two foundry grades went up $2.50 in Cleveland last week on basis of large foundry buying. Dealers and brokers were hunting for tonnage to cover the orders. Steelmaking scrap, however, continued in the doldrums in Cleveland and the Valley but shipments continue on old orders. One Cleveland automotive foundry paid $52 top for 2 ft. cut structural and plate. Turnings and borings in the Valley are also selling at $2 higher levels on smaller sales in absence of other movement.

Birmingham . . . The Atlantic Coast Line Railroad sold approximately 100 carloads of all grades of railroad scrap this week at approximately $1 per ton over price received for its last sale. Buyers of openhearth scrap were out of the market but export demand continued strong. Electric furnace grades advanced another dollar. Cast grades are strong at unchanged prices.

St. Louis . . . Weather in the scrap producing area continues ideal for collecting scrap. A flow of scrap equal to the melt is reaching consumers in the St. Louis industrial district. Price structure is strong and unchanged.

Cincinnati . . . Some openhearth scrap was bought from local sources at $1 under prevailing prices. But at the same time, consumers are paying more to bring in a heavier percentage of material from out-of-district. As a result, THE IRON AGE quotations are holding firm this week. What local scrap is left is expected to be largely drained from the district.

Buffalo . . . Prices are unchanged. Expected orders from the area's biggest purchaser have not yet materialized. Activity in machine shop turnings and short shoveling turnings confirms going prices.

Boston . . . Market here shows little change. Activity continues moderate with eastern Pennsylvania mills buying and export traffic steady.

West Coast . . . Although exporting keeps galloping along, movement of scrap to mills is good. Mills and dealers think present price levels should hold for a while.

SCRAP

for your every requirement

LURIA BROTHERS AND COMPANY, INC.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

MAIN OFFICE
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

PLANTS
LEBANON, PENNA. — DETROIT (ECORSE), MICHIGAN
READING, PENNA. — PITTSBURGH, PENNA.
MODENA, PENNA.
ERIE, PENNA.

OFFICES
BIRMINGHAM, ALA. — DETROIT, MICH. — PITTSBURGH, PENNA.
BOSTON, MASS. — HOUSTON, TEXAS — PUEBLO, COLORADO
BUFFALO, N. Y. — LEBANON, PENNA. — READING, PENNA.
CHICAGO, ILLINOIS — LOS ANGELES, CAL. — ST. LOUIS, MO.
CLEVELAND, OHIO — NEW YORK, N. Y. — SAN FRANCISCO CAL.
SEATTLE, WASH.

Exports-Imports—Livingston & Southard, Inc., 99 Park Avenue, New York, N. Y. Cable Address: FORENTRACO.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Berman

Scrap Prices *(Effective Nov. 8, 1955)*

Pittsburgh

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	30.00 to 31.00
Mixed bor. and ms. turns.	30.00 to 31.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Low phos. punch'gs, plate	49.00 to 50.00
Heavy turnings	42.00 to 43.00
No. 1 RR. hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	54.00 to 55.00
Rails 2 ft and under	59.00 to 60.00
RR. steel wheels	53.00 to 54.00
RR. spring steel	53.00 to 54.00
RR. couplers and knuckles	53.00 to 54.00
No. 1 machinery cast.	50.00 to 51.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	40.00 to 41.00

Chicago

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 factory bundles	46.00 to 47.00
No. 1 dealers' bundles	42.00 to 43.00
No. 2 dealers' bundles	33.00 to 34.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. forge crops	52.00 to 53.00
Low phos. punch'gs, plate	49.00 to 50.00
Low phos. 2 ft and under	48.00 to 49.00
No. 1 RR. hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	56.00 to 57.00
Rerolling rails	65.00 to 67.00
Rails 2 ft and under	61.00 to 62.00
Locomotive tires, cut	51.00 to 52.00
Cut bolsters & side frames	53.00 to 54.00
Angles and splice bars	58.00 to 59.00
RR. steel car axles	57.00 to 58.00
RR. couplers and knuckles	52.00 to 53.00
No. 1 machinery cast	53.00 to 54.00
Cupola cast	49.00 to 50.00
Heavy breakable cast.	41.00 to 42.00
Cast iron brake shoes	38.00 to 39.00
Cast iron car wheels	46.00 to 48.00
Malleable	57.00 to 58.00
Stove plate	40.00 to 41.00

Philadelphia Area

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	28.50 to 29.50
Mixed bor. short turn.	28.50 to 29.50
Cast iron borings	28.50 to 29.50
Shoveling turnings	31.00 to 32.00
Clean cast chem. borings	35.00 to 36.00
Low phos. 5 ft and under	48.00 to 49.00
Low phos. 2 ft and under	49.00 to 50.00
Low phos. punch'gs	49.00 to 50.00
Elec. furnace bundles	47.00 to 48.00
Heavy turnings	42.00 to 43.00
RR. steel wheels	51.00 to 52.00
RR. spring steel	51.00 to 52.00
Rails 18 in. and under	59.00 to 60.00
Cupola cast	42.00 to 44.00
Heavy breakable cast.	45.00 to 46.00
Cast iron car wheels	52.00 to 53.00
Malleable	58.00 to 59.00
Unstripped motor blocks	29.00 to 31.00
No. 1 machinery cast.	48.00 to 49.00

Cleveland

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	36.00 to 37.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	28.50 to 29.50
Shoveling turnings	28.50 to 29.50
Cast iron borings	28.50 to 29.50
Cut struct'r'l & plates, 2 ft & under	51.00 to 52.00
Drop forge flashings	44.00 to 45.00
Low phos. punch'gs, plate	46.00 to 47.00
Foundry steel, 2 ft & under	50.00 to 51.00
No. 1 RR. heavy melting	48.50 to 49.50
Rails 2 ft and under	61.00 to 62.00
Rails 18 in. and under	62.00 to 63.00
Railroad grate bars	37.00 to 38.00
Steel axle turnings	30.00 to 31.00
Railroad cast.	49.00 to 50.00
No. 1 machinery cast.	49.00 to 50.00
Stove plate	45.00 to 46.00
Malleable	51.00 to 52.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$47.50 to $48.50
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	47.50 to 48.50
No. 2 bundles	36.00 to 37.00
Machine shop turn.	27.50 to 28.50
Shoveling turnings	31.50 to 32.50
Cast iron borings	31.50 to 32.50
Low phos. plate	48.50 to 49.50

Buffalo

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 busheling	40.00 to 41.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	45.00 to 46.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	52.00 to 53.00
RR. steel wheels	48.00 to 49.00
RR. spring steel	48.00 to 49.00
RR. couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	40.00 to 41.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles, openhearth	38.50 to 39.50
No. 2 bundles	27.00 to 28.00
New busheling	38.50 to 39.50
Drop forge flashings	38.00 to 39.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Low phos. punch'gs, plate	38.50 to 39.50
No. 1 cupola cast.	40.00 to 41.00
Heavy breakable cast.	34.00 to 35.00
Stove plate	35.00 to 36.00
Automotive cast.	42.00 to 44.00

St. Louis

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	36.00 to 37.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	31.50 to 32.50
Machine shop turn.	27.00 to 28.00
Cast iron borings	28.00 to 29.00
Shoveling turnings	28.00 to 29.00
No. 1 RR. hvy. melting	46.00 to 47.00
Rails, random lengths	52.00 to 53.00
Rails, 18 in. and under	59.00 to 60.00
Locomotive tires uncut	59.00 to 60.00
Angles and splice bars	50.00 to 51.00
Std. steel car axles	49.00 to 50.00
RR. specialties	50.00 to 51.00
Cupola cast	46.00 to 47.00
Heavy breakable cast.	35.00 to 36.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	38.00 to 39.00
Cast iron car wheels	47.00 to 48.00
Malleable	48.00 to 49.00
Unstripped motor blocks	37.00 to 38.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$37.00 to $37.50
No. 2 hvy. melting	30.00 to 30.50
No. 1 bundles	37.00 to 37.50
No. 2 bundles	28.00 to 28.50
No. 1 busheling	37.00 to 37.50
Elec. furnace, 3 ft & under	38.50 to 39.00
Machine shop turn.	20.00 to 20.50
Mixed bor. and short turn.	22.00 to 23.00
Shoveling turnings	23.00 to 24.00
Clean cast chem. borings	22.00 to 23.00
No. 1 machinery cast.	32.00 to 33.00
Mixed cupola cast.	30.00 to 31.00
Heavy breakable cast.	33.00 to 34.00
Stove plate	29.00 to 30.00
Unstripped motor blocks	18.00 to 19.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$41.50 to $42.50
No. 2 hvy. melting	36.00 to 37.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	22.00 to 23.00
Clean cast chem. borings	24.00 to 25.00
No. 1 machinery cast.	39.00 to 40.00
Mixed yard cast.	38.00 to 39.00
Charging box cast.	39.00 to 40.00
Heavy breakable cast.	39.00 to 40.00
Unstripped motor blocks	25.00 to 26.00

Birmingham

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy melting	35.00 to 36.00
No. 1 bundles	38.00 to 39.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	17.00 to 18.00
Electric furnace bundles	43.00 to 44.00
Bar crops and plate	47.00 to 48.00
Structural and plate, 2 ft	46.00 to 47.00
No. 1 RR. hvy. melting	43.00 to 44.00
Scrap rails, random lgth.	53.00 to 54.00
Rails, 18 in. and under	58.50 to 59.50
Angles & splice bars	55.00 to 56.00
Rerolling rails	58.00 to 59.00
No. 1 cupola cast.	47.50 to 48.50
Stove plate	44.50 to 45.50
Charging box cast.	30.00 to 31.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	36.00 to 37.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	35.50 to 36.50
No. 1 bundles	42.00 to 43.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	31.50 to 32.50
Cast iron borings	25.00 to 26.00
Low phos. 18 in. & under	50.00 to 51.00
Rails, random lengths	53.00 to 54.00
Rails, 18 in. and under	60.00 to 61.00
No. 1 cupola cast.	43.00 to 44.00
Hvy. breakable cast.	40.00 to 41.00
Drop broken cast.	49.00 to 50.00

San Francisco

No. 1 hvy. melting	$39.00
No. 2 hvy. melting	37.00
No. 1 bundles	39.00
No. 2 bundles	33.00
No. 3 bundles	29.00
Machine shop turn.	18.00
Cast iron borings	18.00
No. 1 RR. hvy. melting	39.00
No. 1 cupola cast.	45.00

Los Angeles

No. 1 hvy. melting	$39.00
No. 2 hvy. melting	37.00
No. 1 bundles	39.00
No. 2 bundles	33.00
No. 3 bundles	29.00
Machine shop turn.	18.00
Shoveling turnings	21.00
Cast iron borings	18.00
Elec. furn. 1 ft and under	39.00
No. 1 RR. hvy. melting	39.00
No. 1 cupola cast.	45.00

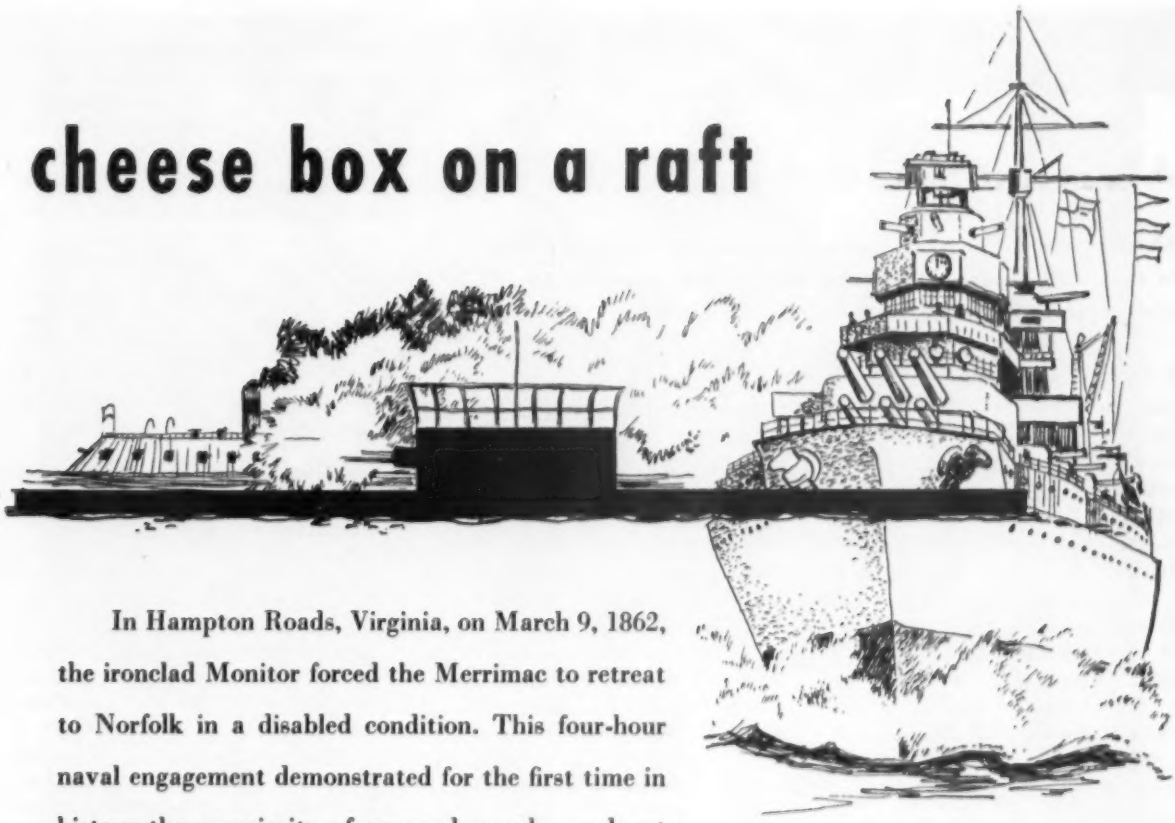
Seattle

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	38.00
No. 2 bundles	34.00
No. 3 bundles	30.00
No. 1 cupola cast.	40.00
Mixed yard cast.	40.00

Hamilton, Ont.

No. 1 hvy. melting	$38.50
No. 2 hvy. melting	35.50
No. 1 bundles	38.50
No. 2 bundles	32.50
Mixed steel scrap	32.50
Bushelings	33.50
Bush., new fact. prep'd	36.50
Bush., new fact. unprep'd	32.50
Machine shop turn.	16.00
Short steel turn.	25.50
Mixed bor. and turn.	$16.00 to 17.00
Rails, rerolling	47.50
Cast scrap	42.00 to 45.00

cheese box on a raft



In Hampton Roads, Virginia, on March 9, 1862, the ironclad Monitor forced the Merrimac to retreat to Norfolk in a disabled condition. This four-hour naval engagement demonstrated for the first time in history the superiority of armored vessels—and put to an end the construction of wooden ships of war.

For today's "Monitors," for guns, tanks, planes —and for the thousands of tools for industry, agriculture and commerce—steel is vitally needed, in millions of tons. To meet all requirements, an adequate supply of scrap must be made available continuously.

For the purchase or sale of iron or steel scrap . . .

phone or write "Your Chicago Broker"

M.S.
KAPLAN
COMPANY

231 S. La Salle St., Chicago

Telephone ANdover 3-3900

Aluminum Looks At Autos

Aluminum executive woos automotive industry in speech to auto engineers . . . Estimates auto market potential at 459 lb of aluminum per car . . . Tungsten opposes tariff cut.

◆ IT'S NO SECRET that aluminum producers have been courting the automotive industry for some time. Their suit has met with some success, but not nearly what the aluminum industry considers its fair share of that lush market.

A strong reminder of this courtship came this week in the speech by David P. Reynolds, vice president, sales, Reynolds Metals Co., to the Detroit section of the Society of Automotive Engineers.

Not too surprisingly for a man with a brand new $2 million anodizing line, Mr. Reynolds stressed the applications of color-anodized aluminum to auto bodies.

Mr. Reynolds predicted a trend to aluminum car roofs, pointing out that there have been several brushed aluminum roofs on special cars in the past two years. As advantages, he cited appearance, durability, ease of cleaning, and—important in this day of air conditioning—efficient solar reflectivity.

Obviously no one, Mr. Reynolds included, expects the all-aluminum car to roll off the assembly lines in the near future.

But some of the arguments in favor of aluminum are persuasive. And the fact that Mr. Reynolds was invited to talk on the subject shows that Detroit designers and engineers are giving the light metal serious consideration.

Automotive uses of aluminum have grown from five to 35 items since 1950. The amount of aluminum used in these applications has been increased four and one-half times.

A little arithmetic shows the size of aluminum's market potential in Detroit: If the entire industry standardized on aluminum for its current applications only, consumption would be 275 lb per car, or, assuming a six million car year, roughly 1.65 billion annually, or about one-half of current total primary capacity. In addition, aluminum producers believe that aluminum is immediately applicable to other uses which would add an additional 32 lb of that metal to each car. And they foresee—realistically they insist—still further applications that would add another 152 lb to each car.

To sum up, aluminum producers now estimate their total market potential in the automotive industry for the near future at 459 lb per car. Again assuming a six million car year, this works out to a whopping 2.75 billion lb.

Also on the aluminum front, a meeting of the Extruders Council is scheduled to take place in Wash., D. C., on Nov. 17. Recommendations of the group will follow a panel session presided over by representatives of the four major North American producers, Alcoa, Reynolds, Kaiser and Alcan.

It is expected that the extruders will request the entire first quarter 1956 call of aluminum to the national stockpile be postponed until a later date. This would mean 100,000 tons would be available to industry.

TUNGSTEN . . . W. Lunsford Long, president of the Tungsten Institute, and also of the Tungsten Mining Corp. appeared before the U. S. Tariff Commission and the Committee for Reciprocity Information to speak for himself and the institute in opposition to proposed tariff reductions for tungsten ore and concentrates.

Mr. Long claims that in 1954 domestic production of tungsten was about three times that of domestic consumption. He attributes this situation to what he terms the complete failure of the Federal purchasing program. Mr. Long, speaking for the institute, insists that the industry must have the present tariff protection in order to develop new market outlets to alleviate the present over supply.

TIN . . . Reports from the International Tin Study Group at The Hague, Holland indicates that in August world consumption went up and U. S. consumption hit its highest peak since January 1951. World consumption hit 12,600 tons of which 5,310 was accounted for in this country. However tin production kept pace with the increased demand indicating a relatively stable tin market can be expected to the end of the year at least.

COPPER . . . New worry in copper this week is labor. Last week's quickie strike in Chile and higher pay demands in Northern Rhodesia ore fields were adding to copper buyers' woes. On top of this summer's labor troubles, strikes now could have very serious ramifications, both in this country and throughout the world, worsening an already bad situation.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Nov. 2	Nov. 3	Nov. 4	Nov. 5	Nov. 7	Nov. 8
Copper, electro, Conn.	43.00	43.00	43.00	43.00	43.00	43.00
Copper, Lake, delivered	43.00	43.00	43.00	43.00	43.00	43.00
Tin, Straits, New York	96.750	96.50	96.50	....	96.375	96.375*
Zinc, East St. Louis	13.00	13.00	13.00	13.00	13.00	13.00
Lead, St. Louis	15.30	15.30	15.30	15.30	15.30	15.30

Note: Quotations are going prices **Tentative*

Twice the life of materials previously used is reported for this group of Ni-Vee bronze half bearing castings used in the first six or eight rolls each side of rollout table on large reversing mills. Ni-Vee type bronze castings are used for various heavy duty steel mill maintenance jobs. Castings shown on this page were produced by A. W. Cadman Manufacturing Company, Pittsburgh, Pa. under their trade name "NICUITE."

NI-VEE bronzes double life of parts in rollout tables and other mill machines

STRENGTH UP TO 90,000 psi and high resistance to wear, impact and galling characterize Ni-Vee bronzes.

Other advantages include easy castability, low shrinkage, pressure tightness, fine grain, economy and versatility.

Containing 5 per cent nickel and 5 per cent tin, Ni-Vee bronzes increase life of gears, cams and similar "constructional" castings. Likewise, the life of "pressure" group castings such as pumps, valves and fittings.

And for bearings, bushings and anti-friction metal, leaded Ni-Vee bronzes process into hard, wear-resistant products that are unmatched by the usual lead-free compositions.

Ni-Vee bronzes are produced by authorized foundries in industrial areas from coast to coast.

Get the facts about nickel-tin bronzes and see how they can save you money. Write now for the valuable data-packed booklets entitled, "THE NI-VEE BRONZES." They are yours for the asking.

Four times life of replaced tin bronze and still good. That's the status of Ni-Vee bronze feed screw nuts cast by A. W. Cadman Mfg. Co., for Babcock & Wilcox, Beaver Falls, Pa.

2,000,000 tons of steel were rolled by a 40" blooming mill, before its Ni-Vee bronze screw box nuts . . . such as the one shown above . . . called for replacement.

INCO THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street New York 5, N. Y.

Nonferrous Prices *(Effective Nov. 8, 1955)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136–.249	.250–3.
1100, 3003....	40.8	38.7	37.5	36.5
5052.....	48.3	43.4	41.7	39.9
6061-0.....	45.4	41.2	39.4	39.3

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6– 8.....	41.6–43.3	56.6–60.2
12–14.....	42.3–43.7	57.5–61.8
24–26.....	45.3–45.7	67.7–72.1
36–38.....	53.6–54.2	90.5–94.3

Screw Machine Stock—2011-T-3

Size*	¼	⅜–½	⅝–1	1¼–1½
Price	54.5	53.4	52.1	50.1

Roofing Sheet, Corrugated

(Per sheet, 26" wide, base, 16,000 lb)

Length* →	72	96	120	144
.019 gage.....	$1.295	$1.727	$2.160	$2.590
.024 gage.....	1.615	2.162	2.692	3.232

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 61¢; 3/16 in., 62¢; ½ in., 61¢; 0.064 in., 78¢; 0.032 in., 99¢. Specification grade higher. Base, 30,000 lb.

Extruded Round Rod: FS, diam ¼ to 0.311 in., 52.5¢; ½ to ⅝ in., 65¢; 1¼ to 1.749 in., 60.5¢; 2½ to 5 in., 57¢. Other alloys higher. Base up to ⅝ diam, 10,000 lb; ⅝ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: FS. In weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 70.7¢; 0.22 to 0.25 lb, 5.9 in., 66.9¢; 0.50 to 0.59 lb, 8.6 in., 63¢; 1.8 to 2.59 lb, 19.5 in., 60.8¢; 4 to 6 lb, 28 in., 57.7¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: FS, 0.049 to 0.057 in. wall thickness: OD ¼ to 5/16 in., $1.625; 5/16 to ⅜ in., $1.475; ½ to ⅝ in., $1.105; 1 to 2 in., 92.5¢; 0.165 to 0.219 in. wall: OD, ⅝ to ¾ in., 75.5¢; 1 to 2 in., 71.5¢; 3 to 4 in., 70.5¢. Other alloys higher. Base OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	56.79	....	58.86
Copper, h-r ...	58.76	55.11	....
Copper, drawn.	....	56.36	....
Low brass ...	53.15	53.09	....
Yellow brass ..	49.27	49.21	....
Red brass	54.54	54.48	....
Naval brass ..	52.83	47.14	45.40
Leaded brass..	....	....	46.74
Com. bronze ..	56.48	56.42	....
Mang. bronze..	56.57	50.67	52.23
Phos. bronze ..	77.14	77.04	....
Munts metal ..	50.94	46.75	45.00
Ni silver, 10 pct	63.05	66.13	68.50

Beryllium copper, CR, 1.9% Be, Base 2000 lb, f.o.b.

Strip	$1.84
Rod, bar, wire	1.81

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	83	99
Strip, CR	102	92	125
Rod, Bar, HR..	87	74	93
Angles, HR ...	87	74	93
Plate, HR	97	87	95
Seamless Tube.	122	110	153
Shot, Blocks		71	...

Titanium

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $14.00-$14.50; alloy $16.50; Plate, HR, commercially pure, $11.50-$12.00; alloy, $12.50-$12.75; Wire, rolled and/or drawn, commercially pure, $10.50-$11.00; alloy, $12.50; Bar, HR or forged, commercially pure, $8.50-$8.75; alloy, $8.50-$9.00.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	24.40
Aluminum pig	22.50
Antimony, American, Laredo, Tex..	33.50
Beryllium copper, per lb conta'd Be.	$43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.70
Cobalt, 97-99% (per lb).....	$2.60 to $2.67
Copper, electro, Conn. Valley	43.00
Copper, Lake, delivered	43.00
Gold, U. S. Treas., per troy oz.	$35.00
Indium, 99.9%, dollars per troy oz..	$2.25
Iridium, dollars per troy oz...	$100 to $120
Lead, St. Louis	15.30
Lead, New York	15.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	32.50
ingot	33.25
Magnesium, sticks, 100 to 500 lb...	53.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$230 to $285
Nickel electro	64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel	60.75
Palladium, dollars per troy oz.	$22.20 to $24
Platinum, dollars per troy oz...	$97 to $99
Silver, New York, cents per troy oz..	91.625
Tin, New York	96.375*
Titanium, sponge, grade A-1	$3.75
Zinc, East St. Louis	13.00
Zinc, New York	13.50
Zirconium, sponge	$10.00

* Tentative

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	41.00
No. 120	40.50
No. 123	40.00
80-10-10 ingot	
No. 305	44.75
No. 315	43.00
88-10-2 ingot	
No. 210	56.25
No. 215	52.75
No. 245	47.25
Yellow ingot	
No. 405	32.75
Manganese bronze	
No. 421	36.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	32.00-33.00
0.60 copper max.	31.75-32.75
Piston alloys (No. 122 type)..	32.75-33.75
No. 12 alum. (No. 2 grade...	30.00-30.50
108 alloy	30.00-30.50
195 alloy	31.50-32.75
13 alloy (0.60 copper max.)...	31.75-32.75
AXS-679	30.00-30.50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½%	31.00-31.25
Grade 2—92-95%	30.00-30.25
Grade 3—90-92%	29.00-29.50
Grade 4—85-90%	28.00-28.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	39	38¼
Yellow brass	28⅞	26½
Red brass	34⅞	33½
Comm. bronze	35⅛	35
Mang. bronze	26⅞	25⅞
Yellow brass rod ends	28⅝	

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	39
No. 2 copper wire	37½
Light copper	35¼
*Refinery brass	35½

* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	39
No. 2 copper wire	37½
Light copper	35¼
No. 1 composition	33 —32½
No. 1 comp. turnings	31½—32
Rolled brass	24¾—25
Brass pipe	24 —24½
Radiators	24½—25
Aluminum	
Mixed old cast.	20 —20½
Mixed new clips	22 —22½
Mixed turnings, dry	20½—21½

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire.	35 —35½
No. 2 heavy copper and wire	34 —34½
Light copper	32 —32½
New type shell cuttings ...	31½—32
Auto radiators (unsweated)..	23 —23½
No. 1 composition	28 —28½
No. 1 composition turnings ..	26 —26½
Unlined red car boxes	23 —23½
Cocks and faucets	23 —23½
Mixed heavy yellow brass	17½—18
Old rolled brass	21 —21½
Brass pipe	23½—24
New soft brass clippings	23 —23½
No. 1 brass rod turnings	21 —21½
Aluminum	
Alum. pistons and struts	16½—17
Aluminum crankcases	17½—18
1100 (2S) aluminum clippings	19½
Old sheet and utensils	16½—17
Borings and turnings	11 —11½
Misc. cast aluminum	16½—17
2024 (24s) clippings	18 —18½
Zinc	
New zinc clippings	8 — 8¼
Old zinc	5 — 5½
Zinc routings	4
Old die cast scrap	3½
Nickel and Monel	
Pure nickel clippings	125
Clean nickel turnings	100
Nickel anodes	125
Nickel rod ends	125
New Monel clippings	54½
Clean Monel turnings ...	44
Old sheet Monel	50
Nickel silver clippings, mixed	23
Nickel silver turnings, mixed.	19
Lead	
Soft scrap lead	12 —12¼
Battery plates (dry)	6½— 6⅝
Batteries, acid free	4¼
Magnesium	
Segregated solids	18½—19
Castings	17½—18
Miscellaneous	
Block tin	80 —81
No. 1 pewter	63 —64
Auto babbitt	42 —43
Mixed common babbitt	17½
Solder joints	19½—20
Siphon tops	43
Small foundry type	16½
Monotype	18
Lino. and stereotype	14 —14½
Electrotype	12 —12½
Hand picked type shells	10½—11
Lino. and stereo. dross	6
Electro dross	5

IRON AGE

STEEL PRICES

(Effective Nov. 8, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$96.00 *B3*		4.65 *B3*	6.00 *B3*	4.65 *B3*						
	Buffalo, N. Y.	$68.50 *B3*	$84.50 *R3, B3*	$96.00 *R3, B3*	5.45 *B3*	4.65 *B3*	6.00 *B3*	4.65 *B3*	4.325 *R3,B3*	6.25 *B3* 6.25 *R7,S10*	6.425 *B3*	9.10 *B3*		
	Claymont, Del.													13.45 *C11*
	Harrison, N. J.								4.375 *A2*	6.30 *A2*	6.425 *A2*			
	Conshohocken, Pa.									6.70 *R6*				
	New Bedford, Mass.													
	Johnstown, Pa.	$68.50 *B3*	$84.50 *B3*	$96.00 *B3*		4.65 *B3*	6.00 *B3*							
	Boston, Mass.									6.80 *T8*				13.80 *T8*
	New Haven, Conn.									6.70 *D1* 7.00 *A5*				
	Phoenixville, Pa.					5.15 *P2*		5.15 *P2*						
	Sparrows Pt., Md.								4.325 *B3*	6.25 *B3*	6.425 *B3*	9.10 *B3*		
	Bridgeport, Wallingford, Conn.	$73.50 *N8*	$89.50 *N8*						4.625 *N8*	6.70 *W1*			7.50 *N8*	
	Pawtucket, R. I. Worcester, Mass.									90 *N7* ..0 *A5*				*A5* 13.80 *N7*
MIDDLE WEST	Alton, Ill.								4.50 *L1*					
	Ashland, Ky.								4.325 *A7*					
	Canton-Massillon, Dover, Ohio		$86.50 *R3*	$96.00 *R3*										13.45 *G4*
	Chicago, Ill.	$68.50 *U1*	$84.50 *R3, U1,W8*	$96.00 *R3, U1,W8*	5.45 *U1*	4.60 *U1, W8*	6.75 *U1, Y1*	4.60 *U1*	4.325 *A1, N4,W8*	6.35 *A1,T8*			7.20 *W8*	13.45 *T8*
	Cleveland, Ohio									6.25 *A5,J3*		9.30 *A5*		13.45 *A5*
	Detroit, Mich.			$96.00 *R5*					4.425 *G3,M2*	6.35 *D1,D2, G3,M2,P11*	6.525 *G3*	9.20 *D2, G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$68.50 *U1*	$84.50 *U1*	$96.00 *U1, Y1*	5.45 *I3*	4.60 *U1, I3*	6.75 *U1, I3*		4.325 *I3, U1,Y1*	6.35 *I3* 6.25 *Y1*	6.425 *I3, U1,Y1*	9.30 *Y1*	7.20 *Y1, U1*	
	Sterling, Ill.								4.425 *N4*					
	Indianapolis, Ind.									6.40 *C5*				
	Newport, Ky.												7.20 *N5*	
	Middletown, Ohio									6.45 *A7*				
	Niles, Warren, Ohio Sharon, Pa.	$68.50 *C10*	$84.50 *C10*	$96.00 *C10*					4.325 *S1, R3*	6.25 *S1, R3,T4*	6.425 *S1, R3*	9.10 *S1, R3*	7.20 *S1*	13.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$68.50 *U1, J3*	$84.50 *J3, U1,C11*	$96.00 *U1, C11*	5.45 *U1*	4.60 *U1, J3*	6.75 *U1, J3*	4.60 *U1*	4.325 *P6*	6.25 *S7,B4*			7.20 *S9*	13.45 *S9*
	Portsmouth, Ohio								4.325 *P7*	6.25 *P7*				
	Weirton, Wheeling, Follansbee, W. Va.					4.60 *W3*			4.325 *W3*	6.25 *F3,W3*	6.425 *W3*	9.10 *W3*		
	Youngstown, Ohio		$84.50 *C10*	$96.00 *Y1, C10*		4.60 *Y1*	6.75 *Y1*		4.325 *U1, Y1*	6.25 *Y1,C5*	6.425 *U1, Y1*	9.30 *Y1*	7.20 *U1, Y1*	13.45 *C5*
WEST	Fontana, Cal.	$76.00 *K1*	$92.00 *K1*	$115.00 *K1*		5.25 *K1*	7.40 *K1*	5.40 *K1*	5.075 *K1*	8.00 *K1*	7.525 *K1*		8.85 *K1*	
	Geneva, Utah		$84.50 *C7*			4.60 *C7*	6.75 *C7*							
	Kansas City, Mo.					4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	
	Los Angeles, Torrance, Cal.		$94.00 *B2*	$116.00 *B2*		5.20 *C7, B2*	7.45 *B2*		5.075 *C7, B2*	8.30 *C1*			8.40 *B2*	
	Minnequa, Colo.					4.90 *C6*			5.425 *C6*					
	Portland, Ore.					5.35 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$94.00 *B2*			5.25 *B2, P9*	7.40 *B2*		5.075 *B2, C7*					
	Seattle, Wash.		$98.00 *B2*			5.35 *B2*	7.50 *B2*		5.325 *B2*					
SOUTH	Atlanta, Ga.								4.525 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$68.50 *T2*	$84.50 *T2*			4.60 *C16, R3,T2*	6.75 *T2*		4.325 *R3, C16,T2*		6.425 *T2*			
	Houston, Lone Star, Tex.	$74.50 *L3*	$89.50 *S2*	$101.00 *S2*		4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	

STEEL PRICES

(Effective Nov. 8, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 10 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.325 *B3*	5.325 *B3*				6.375 *B3*	7.875 *B3*			*W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Conshohocken, Pa.													
	Coatesville, Pa.	4.375 *A2*	5.375 *A2*				6.425 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.025 *B3*			
	Fairless, Pa.	4.375 *U1*	5.375 *U1*				6.425 *U1*	7.925 *U1*				$9.30 *U1*	$8.00 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.325 *B3*	5.325 *B3*	5.85 *B3*			6.375 *B3*	7.875 *B3*	8.60 *B3*		5.125 *B3*	$9.30 *B3*	$8.00 *B3*	
	Worcester, Mass.										5.325 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										5.20 *L1*			
	Ashland, Ky.	4.325 *A7*		5.85 *A7*	5.90 *A7*									
	Canton-Massillon, Dover, Ohio			5.85 *R1, R3*										
	Chicago, Joliet, Ill.	4.325 *A1, W8*					6.375 *U1*				5.025 *A5, N4, R3*			
	Sterling, Ill.										5.125 *N4*			
	Cleveland, Ohio	4.325 *J3, R3*	5.325 *J3, R3*		5.90 *R3*		6.375 *J3, R3*	7.875 *J3, R3*			5.025 *A5*			
	Detroit, Mich.	4.425 *G3, M2*	5.425 *G3* 5.325 *M2*				6.475 *G3*	7.975 *G3*						
	Newport, Ky.	4.325 *N5*	5.325 *N5*	5.85 *N5*										
	Gary, Ind. Harbor, Indiana	4.325 *I3, U1, Y1*	5.325 *I3, U1, Y1*	5.85 *U1, I3*	5.90 *U1, I3*	6.25 *U1*	6.375 *Y1, U1, I3*	7.875 *U1, Y1*			5.025 *Y1*	$9.20 *I3, U1, Y1*	$7.90 *I3, U1, Y1*	6.65 *U1, Y1*
	Granite City, Ill.	4.525 *G2*	5.525 *G2*	6.05 *G2*	6.10 *G2*								$8.00 *G2*	6.75 *G2*
	Kokomo, Ind.	4.425 *C9*		5.95 *C9*						5.475 *C9*	5.125 *C9*			
	Mansfield, Ohio	4.325 *E2*	5.325 *E2*			6.25 *E2*				*E2*				
	Middletown, Ohio		5.325 *A7*	5.85 *A7*	5.90 *A7*	6.25 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.325 *S1, R3, N3*	5.325 *R3, N3*	5.85 *R3* 6.85 *N3*	5.90 *N3*	6.25 *N3*	6.375 *S1, R3*	7.875 *R3*				$9.20 *R3*	$7.90 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 *J3, U1, P6*	5.325 *J3, U1, P6*	5.85 *U1*	5.90 *U1, A7*		6.375 *J3, U1*	7.875 *U1*	8.60 *U1*		5.025 *A5, P6*	$9.20 *J3, U1*	$7.90 *J3, U1*	6.65 *U1*
	Portsmouth, Ohio	4.325 *P7*	5.325 *P7*								5.025 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.325 *W3, W5*	5.325 *W3, W5, F3*	5.85 *W3, W5*		6.25 *W3, W5*	6.375 *W3*	7.875 *W3*				$9.20 *W3, W5*	$7.90 *W3, W5*	6.65 *F3, W5*
	Youngstown, Ohio	4.325 *U1, Y1*	5.325 *Y1*		5.90 *Y1*		6.375 *U1, Y1*	7.875 *Y1*			5.025 *Y1*			
WEST	Fontana, Cal.	5.075 *K1*	6.425 *K1*				7.125 *K1*	8.975 *K1*						
	Geneva, Utah	4.425 *C7*												
	Kansas City, Mo.										5.275 *S2*			
	Los Angeles, Torrance, Cal.										5.825 *B2*			
	Minnequa, Colo.										5.275 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.025 *C7*	6.275 *C7*	6.80 *C7*							5.675 *C7*	$9.95 *C7*	$8.65 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.325 *R3, T2*	5.325 *T2*	5.85 *R3, T2*			6.375 *T2*			5.625 *R3*	5.025 *R3, T2*	$9.30 *T2*	$8.00 *T2*	
	Houston, Tex.										5.275 *S2*			

IRON AGE

STEEL PRICES

(Effective Nov. 8, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				5.575 *B1*	7.425 *B1*	6.80 *B1*					
	Buffalo, N. Y.	4.65 *B3,R3*	4.65 *B3,R3*	5.95 *B5*	5.575 *B3,R3*	7.425 *B3,B5*	6.80 *B3*	4.50 *B3,R3*				6.25 *W6*
	Claymont, Del.							4.80 *C4*		6.30 *C4*	6.725 *C4*	
	Coatesville, Pa.							4.80 *L4*		6.30 *L4*	6.725 *L4*	
	Conshohocken, Pa.							4.50 *A2*	5.575 *A2*		6.725 *A2*	
	Harrisburg, Pa.							5.10 *C3*	5.575 *C3*			
	Hartford, Conn.			6.40 *R3*		7.725 *R3*						
	Johnstown, Pa.	4.65 *B3*	4.65 *B3*		5.575 *B3*		6.80 *B3*	4.50 *B3*		6.30 *B3*	6.725 *B3*	6.25 *B3*
	Fairless, Pa.	4.80 *U1*	4.80 *U1*		5.725 *U1*							
	Newark, N. J.			6.35 *W10*		7.60 *W10*						
	Camden, N. J.			6.35 *P10*								
	Bridgeport, Putnam, Conn.	4.80 *N8*		6.45 *W10*	5.725 *N8*			4.750 *N8*				
	Sparrows Pt., Md.		4.65 *B3*					4.50 *B3*		6.30 *B3*	6.725 *B3*	6.35 *B3*
	Palmer, Worcester, Readville, Mass.			6.35 *W11* 6.45 *B5,C14*		7.725 *A5,B5*		4.50 *R3*				6.55 *A5, W6*
	Spring City, Pa.			6.35 *K4*		7.80 *K4*						
MIDDLE WEST	Alton, Ill.	4.85 *L1*										6.425 *L1*
	Ashland, Newport, Ky.							4.50 *A7,N1*		6.30 *N5*		
	Canton-Massillon, Mansfield, Ohio	4.75 *R3*		5.90 *R2,R3*	5.575 *R3,T5*	7.425 *R2,R3, T5*		4.50 *E2*				
	Chicago, Joliet, Ill.	4.65 *U1, N4,W8,R3, P13*	4.65 *N4,R3, P13*	5.90 *A5,W10, W8,B5,L2*	5.575 *U1,R3, W8*	7.425 *A5,W8, W10,L2,B5*		4.50 *U1,W8, I3,A1,R3*	5.575 *U1*	6.30 *U1*	6.725 *U1*	6.25 *A5,R3, N4,W7*
	Cleveland, Ohio	4.65 *R3*	4.65 *R3*	5.90 *A5,C13*		7.425 *A5,C13*	6.80 *R3*	4.80 *J3,R3*	5.575 *J3*		6.725 *R3,J3*	6.25 *A5, C13*
	Detroit, Mich.	4.75 *G3*	4.75 *G3*	5.90 *R5* 6.10 *B5,P8* 6.15 *P3*	5.575 *R5* 5.675 *G3*	7.425 *R5* 7.625 *B5,P3 P8*	6.90 *G3*	4.80 *G3*			6.825 *G3*	
	Duluth, Minn.											6.25 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.65 *I3, U1, Y1*	4.65 *I3, U1, Y1*	5.90 *M5,R3*	5.575 *I3, U1, Y1*	7.425 *M5, R3*	6.80 *U1,I3, Y1*	4.50 *I3, U1,Y1*	5.575 *I3*	6.30 *U1,Y1*	6.725 *U1, I3,Y1*	6.35 *M4*
	Granite City, Ill.							4.70 *G2*				
	Kokomo, Ind.											6.35 *C9*
	Sterling, Ill.	4.75 *N4*	4.75 *N4*									6.35 *N4*
	Niles, Warren, Ohio Sharon, Pa.	4.65 *R3,C10*		5.90 *C10*	5.575 *C10*	7.425 *C10*	6.80 *R3*	4.50 *S1,R3*		6.30 *S1*	6.725 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.65 *J3, U1, C11*	4.65 *J3, U1*	5.90 *A5,C8, C11,J3, W10,B4,R3*	5.575 *U1,C11*	7.425 *A5,C11, W10,C8,R3*	6.80 *J3, U1*	4.50 *J3, U1*	5.575 *U1*	6.30 *U1*	6.725 *J3, U1*	6.25 *A5,J3, P6*
	Portsmouth, Ohio											6.25 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.65 *W3*						4.50 *W3,W5*				
	Youngstown, Ohio	4.65 *U1,Y1, C10,R3*	4.65 *U1,Y1, R3*	5.90 *Y1, U1*	5.575 *U1,Y1, C10*	7.425 *Y1,C10* 7.625 *F2*	6.80 *U1,Y1*	4.50 *U1,Y1, R3*		6.30 *Y1*	6.725 *Y1*	6.25 *Y1*
WEST	Emeryville, Cal.	5.40 *J5*	5.40 *J5*									
	Fontana, Cal.	5.35 *K1*	5.35 *K1*		6.625 *K1*		7.50 *K1*	5.15 *K1*		6.95 *K1*	7.375 *K1*	
	Geneva, Utah							4.50 *C7*			6.725 *C7*	
	Kansas City, Mo.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*					6.50 *S2*
	Los Angeles, Torrance, Cal.	5.35 *B2,C7*	5.35 *B2,C7*	7.35 *R3*	6.625 *B2*		7.50 *B2*				7.625 *B2*	7.20 *B2*
	Minnequa, Colo.	5.10 *C6*	5.10 *C6*					5.35 *C6*				6.50 *C6*
	Portland, Ore.	5.40 *O2*	5.40 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.35 *C7* 5.40 *B2,P9*	5.35 *C7* 5.40 *B2,P9*				7.55 *B2*					7.20 *C7*
	Seattle, Wash.	5.40 *B2,P12, N6*	5.40 *B2,P12*				7.55 *B2*	5.40 *B2*		7.20 *B2*	7.625 *B2*	
SOUTH	Atlanta, Ga.	4.85 *A8*	4.85 *A8*									6.45 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.65 *T2,C16, R3*	4.65 *T2,C16, R3*				6.80 *T2*	4.50 *T2,R3*			6.725 *T2*	6.25 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*	4.85 *L3* 4.90 *S2*		6.40 *S2*	6.825 *S2*	6.50 *S2*

Steel Prices *(Effective Nov. 8, 1955)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Disston & Sons, Inc., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Lackede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmith Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $290 per net ton

	BUTTWELD														SEAMLESS							
	⅛ In.		¼ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75								
Youngstown *R3*	17.50	0.25	20.50	4.25	23.00	7.75	25.50	9.00	26.00	10.00	26.50	10.50	28.00	10.75								
Fontana *K1*	6.00	+9.25	9.00	+5.25	11.50	+1.75	14.00	+1.00	14.50	+0.00	15.00	0.50	16.50	0.25								
Pittsburgh *J3*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Alton, Ill. *L1*	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75								
Sharon *M3*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75								
Fairless *N2*	15.00	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75								
Pittsburgh *N1*	17.00	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Wheeling *W5*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75								
Wheatland *W4*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75								
Youngstown *Y1*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Indiana Harbor *Y1*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Lorain *N2*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75								
Youngstown *R3*	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75								
Fairless *N2*	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75								
Fontana *K1*	10.50		14.50		16.50		17.00		17.50		18.00		18.50									
Pittsburgh *J3*	22.0	6.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+8.00	13.00	+2.75	15.50	+0.25	29.50	4.75
Alton, Ill. *L1*	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75								
Sharon *M3*	22.0	6.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75								
Pittsburgh *N1*	22.0	6.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+8.00	13.00	+2.75	15.50	+0.25	29.50	4.75
Wheeling *W5*	22.0	6.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75								
Wheatland *W4*	22.0	6.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75								
Youngstown *Y1*	22.0	6.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+8.00	13.00	+2.75	15.50	+0.25	29.50	4.75
Indiana Harbor *Y1*	21.0	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Lorain *N2*	22.0	6.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+8.00	13.00	+2.75	15.50	+0.25	29.50	4.75

Threads only, buttweld and seamless 2½ pt higher discount. Plain ends, buttweld and seamless, 3-in. and under, 4½ pt higher discount. Buttweld jobbers discount, 5 pct.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb, East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2 in., 1½ pt.; 2½ and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

Steel Prices *(Effective Nov. 8, 1955)*

To identify producers, see Key on preceding page.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.725	5.65	5.825	....	....	....	....
So. Chicago *R3*	....	....	....	7.90	....	....	....
Ensley *T2*	4.725	5.65	....	....	....	....	....
Fairfield *T2*	....	5.65	....	7.90	....	5.625	....
Gary *U1*	4.725	5.65	....	....	....	5.625	....
Ind. Harbor *I3*	4.725	....	5.825	7.90	....	5.525	....
Johnstown *B3*	....	5.65	....	....	....	....	....
Joliet *U1*	....	5.65	5.825	....	....	....	....
Kansas City *S2*	....	....	....	7.90	....	....	....
Lackawanna *B3*	4.725	5.65	5.825	....	....	5.625	....
Minnequa *C6*	4.725	6.15	5.825	7.90	....	5.625	12.40
Pittsburgh *O1*	....	....	....	....	11.90	....	12.40
Pittsburgh *P5*	....	....	....	....	....	....	12.40
Pittsburgh *J3*	....	....	....	7.90	....	....	....
Seattle *B2*	....	....	....	8.40	....	5.775	12.90
Steelton *B3*	4.725	....	5.825	....	....	5.625	....
Struthers *Y1*	....	....	....	7.90	....	....	....
Torrance *C7*	....	....	....	....	....	5.775	....
Williamsport *S5*	....	5.65	....	....	....	....	....
Youngstown *R3*	....	....	....	7.90	....	....	....

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	8.40	8.60	....
Armature	9.35	9.60	10.10
Elect.	9.95	10.20	10.70
Meter	10.95	11.20	11.70
Dynamo	11.85	12.10	12.60
Trans. 72	12.80	13.05	13.55
Trans. 65	13.35	Grain Oriented	
Trans. 58	13.85	Trans. 80	17.45
Trans. 52	14.85	Trans. 73	17.95

Producing points: Beech Bottom *(W5)*; Brackenridge *(A3)*; Granite City *(G2)*; Indiana Harbor *(I3)*; Mansfield *(E2)*; Newport, Ky. *(N5)*; Niles, O. *(N3)*; Vandergrift *(U1)*; Warren, O. *(R3)*; Zanesville *(A7)*.
* Coils 75¢ higher.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9-15½ ga.	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Annl'd ¢/lb.	Merch. Wire Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City *R3*	152	162	...	173	175	7.40	7.80
Aliquippa, Pa. *J3*	152	162	....	....	....	7.40	7.80
Atlanta *A8*	154	167	...	175	180	7.50	8.025
Bartonville *K2**	154	168	...	175	181	7.50	8.075
Buffalo *W6*	....	....	....	....	....	7.40	7.80
Chicago, Ill. *N4***	152	166	....	173	179	7.40	8.00
Cleveland *A6*	157	....	....	....	....	7.40	....
Cleveland *A5*	....	....	....	....	....	7.40	....
Crawfordsville *M4**	154	167	....	175	175	7.50	8.05
Donora, Pa. *A5*	152	162	....	173	175	7.40	7.80
Duluth *A5*	152	162	....	173	175	7.40	7.80
Fairfield, Ala. *T2*	152	162	....	173	175	7.40	7.80
Galveston *D4*	157	....	....	....	....	....	....
Houston *S2*	167	170	....	....	180	7.65	8.05
Johnstown, Pa. *B3**	152	166	....	....	175	7.40	7.80
Joliet, Ill. *A5*	152	162	....	173	175	7.40	7.80
Kokomo, Ind. *C9*	154	154	....	175	177	7.50	7.90
Los Angeles *B2**	....	....	....	....	....	8.35	8.925
Kansas City *S2*	167	174	....	178	180	7.65	8.05
Minnequa *C6*	157	167	162	178	180	7.65	8.05
Monessen *P6*	152	162	....	....	....	7.40	7.80
Moline, Ill. *R3*	....	162	162	....	....	....	....
Pittsburg, Cal. *C7*	171	185	....	....	195	8.35	8.75
Portsmouth *P7*	....	....	....	....	....	7.40	....
Rankin, Pa. *A5*	152	162	....	....	175	7.40	7.80
So. Chicago *R3*	152	162	157	173	175	7.40	7.80
S. San Francisco *C6*	....	....	....	197	195	8.35	8.75
Sparrows Pt. *B3**	154	....	....	175	181	7.50	8.075
Struthers, O. *Y1*	....	....	....	....	....	7.40	7.80
Worcester *A5*	158	....	....	....	....	7.70	....
Williamsport, Pa. *S5*	....	....	160	....	....	....	....

Galvanized products computed with zinc at 5¢ per lb. Exceptions: *zinc at 12.5¢ per lb; **13¢ zinc.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

City	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Baltimore	$.10	7.03	8.32	8.37	7.65	.....	7.21	7.93	7.61	8.62	14.38	13.44–13.96	16.36	16.29–16.49
Birmingham	.15	6.80	7.93	8.85	7.06	.....	6.99	7.28	7.06	9.35	.....	.....	.....	.....
Boston	.10	7.70	8.81	10.27	7.94–7.96	10.30	7.89	8.13	7.83	9.53	13.65–13.80	13.40–13.45	16.65	16.50
Buffalo	.30	6.80	8.05	9.77	7.15	.....	7.15	7.40	7.10	7.90	.....	13.10	.....	16.15
Chicago	.25	6.80	8.09	8.50	7.06	.....	6.99	7.28	7.06	7.75	13.20	12.85	16.05	15.90
Cincinnati	.25	6.92	8.33	8.90	7.30	.....	7.28	7.75	7.32	8.05	13.44	13.09	16.29	16.14
Cleveland	.30	6.80	8.00	8.85	7.16	.....	7.16	7.61	7.14	7.85	.....	12.91	.....	15.96
Denver		8.60	10.00	11.22	8.90	.....	8.60	8.75	8.90	9.82	.....	.....	.....	17.97
Detroit	.25	6.99	8.28	8.78	7.34	8.15	7.27	7.75	7.36	8.04	13.40	13.05	16.25	16.10
Houston		7.85	8.75	10.49	8.15	.....	7.80	8.20	8.25	9.85–9.95	14.35	14.00	17.15	16.80
Kansas City	.20	7.47	8.76	9.17	7.73	.....	7.66	7.95	7.75	8.52	.....	13.52	.....	.....
Los Angeles	.10	8.05	10.00	11.00	8.35	.....	8.05	8.30	8.05	11.25	.....	14.25	.....	17.85
Memphis	.10	7.12	8.25	.....	7.38	.....	7.31	7.60	7.40	9.15	.....	.....	.....	.....
Milwaukee	.25	6.89	8.18	8.59	7.15	.....	7.08	7.45	7.17	7.94	.....	12.94	.....	15.99
New Orleans	.15	7.20	8.35	.....	7.45	.....	7.40	7.70	7.50	9.50	.....	.....	.....	.....
New York	.10	7.46	8.68	9.44	8.07	9.95	7.76	7.99	7.96	9.48	13.63	13.28	16.48	16.33
Norfolk	.20	7.25	.....	.....	7.65	.....	7.45	7.95	7.65	9.50	.....	.....	.....	.....
Philadelphia	.10	7.14	8.42	9.35	7.67	.....	7.37	7.74	7.64	8.46	13.36–13.51	13.16	16.36	16.21
Pittsburgh	.25	6.80	8.09	9.20	7.16	9.00	6.99	7.28	7.08	7.85	13.20	12.85	16.05	15.90
Portland		7.80–8.60	8.80	10.65	8.00	.....	7.75	7.85–8.15	7.95	12.20	.....	15.00	.....	17.50
Salt Lake City	.20	.....	10.60	.....	9.35	.....	.....	9.20	9.15	.....	.....	.....	.....	.....
San Francisco	.10	8.10	9.65	10.15	8.35	.....	8.05	8.25	8.05	11.20*	.....	14.25	.....	17.85
Seattle	.60	8.55	10.40	10.80	8.65	.....	8.20	8.30	8.35	11.70	.....	14.60	.....	17.65
St. Louis	.25	7.09	8.38	9.19	7.35	.....	7.28	7.68	7.37	8.14	13.49	13.14	16.35	16.19
St. Paul	.25	7.46	8.29–9.14	9.16	7.72	.....	7.65	7.94	7.74	8.51	.....	13.51	.....	16.38

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.
Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.25 delivery.
* Plus analysis charge.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bristol, Conn., *W13*	.....	.....	10.80	12.95	15.65
Buffalo, N. Y. *R7*	7.00	8.95	10.50	12.65	15.35
Carnegie, Pa. *S9*	.....	8.95	10.50	12.65	15.35
Cleveland *A5*	7.00	8.95	10.50	12.65	15.35
Detroit *D1*	7.10	9.05	10.60	12.75	.....
Detroit *D2*	7.10	9.05	10.60	.....	.....
Harrison, N. J. *C11*	.....	.....	10.80	12.95	15.65
Indianapolis *C5*	7.15	9.10	10.50	12.65	15.35
New Castle, Pa. *B4*	7.00	8.95	10.50	12.65	.....
New Haven, Conn. *D1*	7.45	9.25	10.80	12.95	.....
Pawtucket, R. I. *N7*	7.55	9.25	10.80	12.95	15.65
Pittsburgh *S7*	7.00	8.95	10.50	12.65	15.35
Riverdale, Ill. *A1*	7.10	8.95	10.50	12.65	15.35
Sharon, Pa. *S1*	7.00	8.95	10.50	12.65	15.35
Trenton *R4*	.....	.....	.....	.....	.....
Wallingford *W1*	7.45	9.25	10.80	12.95	15.65
Warren, Ohio *T4*	7.00	8.95	10.50	12.65	15.35
Weirton, W. Va. *W3*	7.10	8.95	10.50	.....	.....
Worcester, Mass. *A5*	7.85	9.25	10.80	12.95	15.65
Youngstown *C5*	7.00	8.95	10.50	12.65	15.35

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	30.87	36.51	29.93	.....
	2½	12	41.57	49.16	40.31	.....
	3	12	47.99	56.76	46.55	.....
	3½	11	56.03	66.27	54.34	.....
	4	10	74.41	88.00	72.17	.....
National Tube	2	13	30.87	36.51	29.93	.....
	2½	12	42.57	49.16	40.31	.....
	3	12	47.99	56.76	46.55	.....
	3½	11	56.03	66.27	54.34	.....
	4	10	74.41	88.00	72.17	.....
Pittsburgh Steel	2	13	30.87	36.51	.....	.....
	2½	12	41.57	49.16	.....	.....
	3	12	47.99	56.76	.....	.....
	3½	11	56.03	66.27	.....	.....
	4	10	74.41	88.00	.....	.....

Miscellaneous Prices

(Effective Nov. 8, 1955)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb
18	4	1	—	—	$1.60
18	4	1	—	5	2.305
18	4	2	—	—	1.765
1.5	4	1.5	8	—	.96
6	4	3	6	—	1.35
6	4	2	5	—	1.105

High-carbon chromium	.77
Oil hardened manganese	.43
Special carbon	.39
Extra carbon	.32
Regular carbon	.275

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

		Plate (*A3, J2, L4*)			Sheet (*I2*)
	Cladding	10 pct	15 pct	20 pct	20 pct
Stainless Type	304	30.30	33.15	36.05	32.50
	316	35.50	38.45	41.40	47.00
	321	32.00	34.85	37.75	37.25
	347	34.40	37.90	41.40	48.25
	405	25.80	29.60	33.35	
	410, 430	25.30	29.10	32.85	

CR Strip (*S9*) Copper, 10 pct, 2 sides, 28.00; 1 side, 30.00.

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective for 1955 season.

	Gross Ton
Openhearth lump	$11.25
Old range, bessemer	10.40
Old range, nonbessemer	10.25
Mesabi, bessemer	10.25
Mesabi, nonbessemer	10.10
High phosphorus	10.00

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	25.75
Detroit, f.o.b.	26.25
New England, del'd	26.05
Seaboard, N. J., f.o.b.	25.50
Philadelphia, f.o.b.	25.00
Swedeland, Pa., f.o.b.	25.00
Plainesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	24.40
Lone Star, Tex., f.o.b.	19.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	23.00	40	100, 110	9.80
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.25	17	72	10.35
7	60	24.50	14	72	10.85
6	60	27.25	12	60	11.75
4	40	30.25	10	60	11.80
3	40	32.00	8	60	12.10
2½	30	33.75			
2	24	32.50			

* Prices shown cover carbon nipples.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolt

	Discounts Full case Quantity	Full case 20,000 lb. or more
⅛ in. & smaller x 6 in. & shorter	61	63
Larger than ⅛ in. diam. and all diam. longer than 6 in.	55	57
Rolled thread carriage bolts ⅛ in. & smaller x 6 in. and shorter	61	63
Lag, all diam. x 6 in. & shorter	61	63
Lag, all diam. longer than 6 in.	55	57
Plow bolts	61	63

Nuts, Hex., H.P., reg. & hvy.

⅝" or smaller	64	66
⅞" to 1⅛" inclusive	63	65
1¼" to 1⅜" inclusive	65	67
1⅝" and larger	61	63

C.P. Hex. regular & hvy.

⅝" or smaller	64	66
⅞" and larger	61	63

Hot Galv. Nuts (all types)

1⅛" or smaller	44	47

Finished, Semi-finished, Hex. Nuts

⅝" and smaller	66	66
⅞" and larger	63	63

Add 25% for less than case or keg quantity.

Rivets

	Base per 100 lb
½ in. and larger	$9.95
	Pct Off List
7/16 in. and smaller	32

Cap Screws

	Discount Bright	Discount H.C. Heat
	Treated	
New std. hex head, packaged		
¼" thru ⅛" diam. x 6" and shorter	34	20
9/16 and ⅝" x 6" and smaller and shorter	31	16
¾", ⅞", 1" x 6" and shorter	8	+11
New std. hex head, bulk*		
¼" thru ⅛" diam. x 6" and shorter	49	41
9/16" and ⅝" diam. x 6" and shorter	48	39
¾", ⅞", 1" x 6" and shorter	31	20

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Discount Stove Bolts
Packaged, package list	27	38
Bulk, bulk list		
	Quantity	
¼-in. diam. & under	25,000-200,000	20 61
5/16-in. diam. & larger	15,000-100,000	20 61
All diam. over 3 in. long	5,000-100,000	— 61

Machine Screw & Stove Bolt Nuts

	Discount Hex	Discount Square
Packaged, package list	24	27
Bulk, bulk list		
	Quantity	
⅝-in. diam. & smaller	25,000-200,000	18 20

CAST IRON WATER PIPE INDEX

Birmingham	109.2
New York	121.5
Chicago	122.9
San Francisco-L. A.	131.1

Oct. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick — *Carloads per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa., (except Salina, Pa., add $5.00)	$122.00
No. 1 Ohio	
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	18.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$128.00
Childs, Hays, Pa.	133.00
Chicago District	138.00
Western Utah	144.00
California	151.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O.	145.00
Curtner, Calif.	163.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	21.00
Silica cement, net ton, bulk, Hays, Pa.	24.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	23.00
Silica cement, net ton, bulk, Utah and Calif.	32.00

Chrome Brick — *Per net ton*

Standard chemically bonded, Balt.	$91.00
Standards chemically bonded, Curtner, Calif.	101.25
Burned, Balt.	85.00

Magnesite Brick

Standard Baltimore	$114.00
Chemically bonded, Baltimore	102.00

Grain Magnesite — *St. %-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed	$64.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	40.00
in sacks	46.00

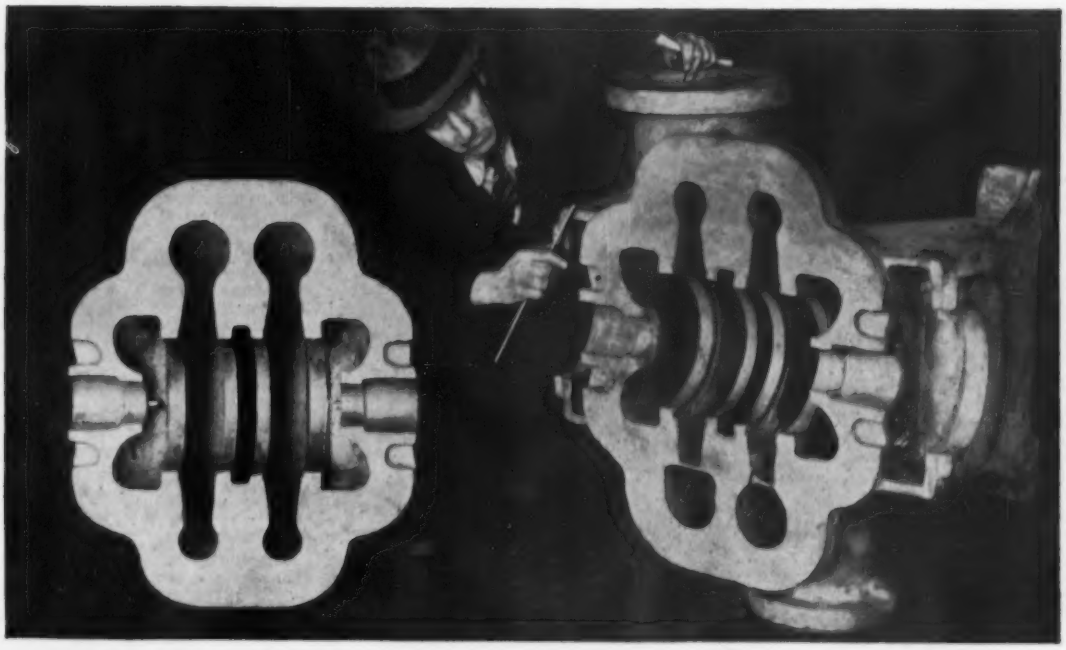
Dead Burned Dolomite — *Per net ton*

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$15.00
Midwest	15.60
Missouri Valley	14.00

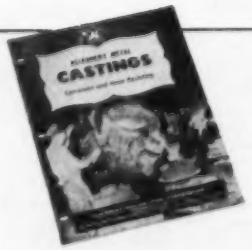
METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags	11.25¢
Canadian sponge iron, Del'd in East, carloads	11.50¢
Domestic sponge, iron, 98+% Fe, carlond lots	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 00.8+% Fe.	83.0¢ to $1.48
Aluminum freight allowed	34.50¢
Brass, 10 ton lots	37.50¢ to 50.00¢
Copper, electrolytic	58.75¢
Copper, reduced	58.75¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd.	$3.60
Lead	7.50¢ plus metal value
Manganese	70.0¢
Molybdenum, 99%	$3.00 to $3.25
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed, #80	$1.18
Silicon	42.50¢
Solder powder .7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	91.0¢
Stainless steel, 316	$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$4.50
Zinc, 10 ton lots	18.75¢ to 32.50¢



There's NO problem in Stainless Castings that we can't answer for you—



Write for your copy: "ALLEGHENY METAL CASTINGS"

32 pages of valuable and complete data on stainless castings: analyses, properties, technical data on handling and heat treatment, typical applications, how to order, etc.

ADDRESS DEPT. A-71

Odd shapes or intricate sections are certainly no problem—look at some of our Allegheny Metal casting products illustrated above. We could show you hundreds more. And size is no consideration, either—we're equipped to handle any stainless castings—from a few ounces to thousands of pounds.

The really important point for you to consider is not the matter of shape or size, but of *experience.* The AL Buffalo Foundry is a group of specialists in high-alloy steel castings *exclusively* . . . pioneers in both the static and vertical-centrifugal methods of casting stainless steels.

For your assurance, there's a long record of years of successfully answering difficult service conditions with sound, clean-grained Allegheny Metal castings—free from defects, easy to machine and dependable in supply. ● Let us quote on *your* stainless casting requirements. *Allegheny Ludlum Steel Corporation, Henry W. Oliver Building, Pittsburgh 22, Pennsylvania.*

You can make it **BETTER** with

Allegheny Metal

AL® TIME-TESTED STAINLESS STEEL

WAS SUES Warehouse stocks carried by all Ryerson Steel plants

Ferroalloy Prices

(Effective Nov. 8, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 67-71% Cr, .30-1.00% max. Si.

0.02% C	38.50	0.20% C	35.50
0.06% C	36.50	0.50% C	35.25
0.10% C	36.00	1.00% C	34.00
0.15% C	35.75	2.00% C	33.75

4.00-4.50 C, 67.70% Cr, 1-2% Si.... 36.25
3.50-5.00% C, 57-64% Cr, 2.00-4.00% Si 25.00

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	28.65
Ton lots	30.55
Less ton lots	32.05

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 3¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.27
0.50% max. C	1.27
9 to 11% C, 88-91% Cr, 0.75% Fe..	1.36

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads	41.85
Ton lots	46.15
Less ton lots	48.65

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.

30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	22.95
Ton lots	25.25
Less ton lots	26.75

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	23.05
Ton lots	24.95
Less ton lots	25.95

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	19.65
Less ton lots	20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	16.60
Ton lots	18.10
Less ton lots	19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.25
Less ton lots	19.50

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	9.50
Clairton, Pa.	9.50
Sheridan, Pa.	9.50
Philo, Ohio	9.50

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	12.10
Ton lots packed	14.30

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$86.00
19 to 21%	3% max.	88.00
21 to 23%	3% max.	90.50

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.00
Ton lots	43.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	30.00
Ton lots	32.00
250 to 1999 lb	34.00
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn... 21.85

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton Lots	Less
0.07% max. C, 0.06% P, 90% Mn	32.00	33.85	35.05
0.07% max. C	29.95	31.80	33.80
0.15% max. C	28.45	30.30	31.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ fob shipping point.

Carload bulk	11.20
Ton lots	12.65
Briquet contract basis carloads, bulk, delivered, per lb of briquet	12.70
Ton lots, packed	14.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $90.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.50. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96.50% Si, 2% Fe	23.75	21.45
98% Si, 1% Fe	23.35	21.95

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.75
Ton lots, packed	9.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

50% Si	11.75	75% Si	15.40
65% Si	14.50	85% Si	17.10
	90% Si	18.50	

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.10
Crucible	3.10
High speed steel (Primos)	3.30

Alsifer, 20% Al, 40% Si, 40% Fe,

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.35¢
Ton lots	11.50¢

Calcium molybdate, 46.3-46.6%

f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-60%, 2 in.

x D contract basis, delivered per pound contained Cb.

Ton lots	$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20%

Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Cb plus Ta.... $4.65

Ferromolybdenum, 55-75%, 200-lb

containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.46

Ferrophosphorus, electric, 23-

26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton..... $90.00
10 tons to less carload..... $110.00

Ferrotitanium, 40% regular grade,

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.38

Ferrotitanium, 25% low carbon,

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.50
Less ton lots..... $1.55

Ferrotitanium, 15 to 18% high

carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton..... $177.00

Ferrotungsten, ¼ x down,

packed, per pound contained W, ton lots, f.o.b..... $3.45

Molybdic oxide, briquets, per lb

contained Mo, f.o.b. Langeloth, Pa. $1.27
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.24

Simanal, 20% Si, 20% Mn, 20%

Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	15.50¢
Ton lots, packed lump	16.75¢
Less ton lots	$1.55

Vanadium oxide, 88-89% V_2O_5

contract basis, per pound contained V_2O_5 ..... $1.33

Zirconium contract basis, per lb

of alloy

35-40%, f.o.b. freight allowed, carloads, packed	26.25¢
12-15%, del'd, lump, bulk-carloads	8.50¢

Boron Agents

Borosil, contact prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B, 3.14%, Si, 40-45%, per lb contained 2.... $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed

Ton lots per pound..... 18.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50%, max. Al, 0.50% max. C, 1 in. x D, ton lots.... 1.20
F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	$1.00
No. 79	50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

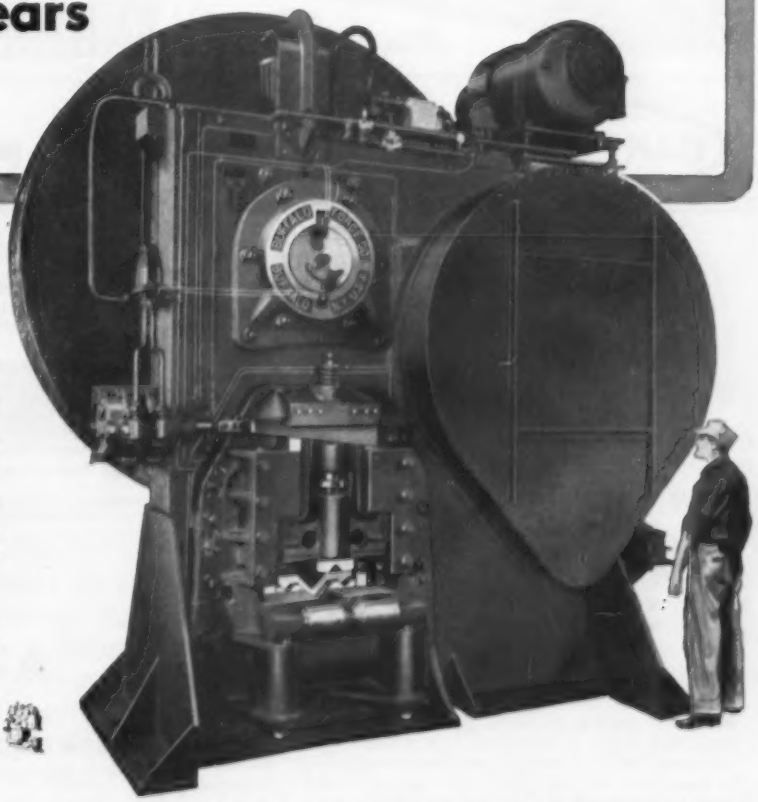
Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots..... $2.05

Silcaz, contract basis, delivered.
Ton lots ..... 45.00¢

ECONOMY in FORGING STARTS with the CUTTING!

YOU CAN STEP UP OUTPUT and QUALITY with "BUFFALO" Billet Shears



First, the high cutting rates of "Buffalo" Billet Shears step up your production. The big No. 17 at right shears six 9" squares or 10" rounds per minute, and speeds are correspondingly higher in our smaller models. Second, your cuts are clean, square and uniform. The knife penetrates only 3/16", localizing an accurate vertical fracture. *Write today for Bulletin 3295-B and see the "Q" Factor* features that make "Buffalo" Billet Shears your most economical and accurate means of preparing stock for forging.*

**The "Q" Factor—the built-in Quality which provides trouble-free satisfaction and long life.*

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

BUFFALO FORGE COMPANY

492 BROADWAY BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING • PUNCHING • SHEARING • BENDING

UNIFORMITY IN PRECISION
COLD ROLLED STRIP
FERROUS-NON FERROUS METALS
Improved End Product Performance,
Production Speed, Tool Life
Width to 8" — Thickness down to .0015
Tolerance as tight as ± 0001
MAKEPEACE
D. E. MAKEPEACE COMPANY ATTLEBORO, MASS.
Division of Union Plate and Wire Company

MUNDT

PERFORATED METALS

The few perforations illustrated are indicative of the wide variety of our line—we can perforate almost any size perforation in any kind of metal or material required. Send us your specifications.

Sixty-seven years of manufacturing perforated metals for every conceivable purpose assure satisfaction.

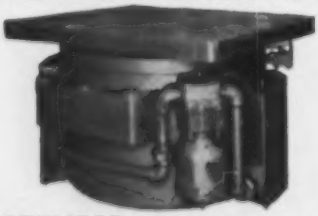
Write for New Catalog of Patterns

TIN, STEEL, COPPER, ALUMINUM, BRONZE
BRASS, ZINC, ANY METAL, ANY PURPOSE

CHARLES MUNDT & SONS
50 FAIRMOUNT AVE. JERSEY CITY, N. J.

BAKER **DIE CUSHIONS**
FOR ALL TYPE POWER PRESSES

PNEUMATIC & HYDROPNEUMATIC . . .
WITH OR WITHOUT LOCKING DEVICES



NEW PATENTED CL TYPE PNEUMATIC DIE CUSHION
WITH INTEGRAL HYDRAULIC LOCKING DEVICE

- ★ BUILT MORE COMPACTLY FOR SMALL SPACES
- ★ FEWER PARTS
- ★ COMPLETELY SELF CONTAINED
- ★ LOWER INITIAL COST
- ★ LESS MAINTENANCE COST

With the standard type locking device mounted below a pneumatic cushion, it is necessary to mount the press over a pit because the over-all height of a standard type cushion is too great. Usually this compact Baker Cushion requires *no pit*. The cushion is mounted in the press through the bed opening with minimum loss of time and production. For full information write

BAKER BROTHERS, INC. 1030 POST ST. TOLEDO 10, OHIO

CHICAGO **STEEL PRESS BRAKES**

43 Standard Sizes

DIES Punching and Forming for All Makes and Sizes of Press Brakes.

4908

DREIS & KRUMP MANUFACTURING COMPANY
7438 S. Loomis Blvd., Chicago 36, Illinois
CHICAGO

READ
THE
ADVERTISING PAGES

- Equipment
- Materials
- Services

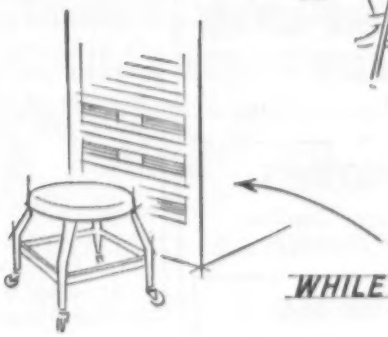
Sources for every need in the Metalworking Industry.

THE IRON AGE

USE STANDARD HALLOWELL STOOLS AND CHAIRS IN PLANT MODERNIZATION

MODEL 206 - ROUNDED SEAT WITH CLAMP-TYPE BACK

IN THE TOOLROOM



WHILE FILING

AT DRAFTING BOARDS

DESKS

OR WORK BENCHES

MODEL 230
ROUNDED SEAT
WITHOUT BACK
4" HEIGHT ADJUSTMENTS
IN 1" INCREMENTS

MODEL 250
SHAPED PLYWOOD SEAT
POSTURE BACK

VARIOUS HEIGHTS, FIXED AND ADJUSTABLE
SEVERAL SEAT MATERIALS -- ALL STANDARD

Standard Units · Standard Accessories · Welded Steel Construction · Stocked by Leading Shop Equipment Dealers · Send for "Stoolcraft" - a Humorous Booklet on Where You Can Use Hallowell Stools and Chairs. Hallowell Shop Equipment Division, Standard Pressed Steel Co., Jenkintown 17, Pa.

HALLOWELL SHOP EQUIPMENT DIVISION
STANDARD PRESSED STEEL CO.
SPS
JENKINTOWN PENNSYLVANIA

BENCHES (CABINET, WORK, UNIT) • STOOLS AND CHAIRS • SHOP DESKS • TOOL STANDS AND CABINETS • DRAWERS, DRAWER TIERS • STEEL CARTS • SHELVING

RAILWAY EQUIPMENT
FOR SALE
Used - As Is - Reconditioned

RAILWAY CARS
All Types

"SERVICE-TESTED"
FREIGHT CAR REPAIR PARTS
For All Types of Cars

LOCOMOTIVES
Diesel, Steam, Gasoline, Diesel-Electric

1—80-Ton, 0-6-0
LIMA STEAM SWITCHING LOCOMOTIVE
Excellent I.C.C. Condition

RAILWAY TANK CARS and STORAGE TANKS
6,000- 8,000- and 10,000-Gallon Cleaned and Tested

CRANES
Overhead and Locomotive

RAILS
New or Relaying

IRON & STEEL PRODUCTS, Inc.

General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: Mitchell 6-1212

New York Office
50-b Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Chicago Sales Solid . . . Used tools are sailing into November with customers hot after production equipment, strong movement of midwestern machine tools to out-of-area customers and little lag in the rate of incoming inquiries. General effect is to convince most people in the business that fourth quarter will wind up, on a comparative basis with the year ago period, as one of the best quarters of the year to date, if not a pace setter for the entire year.

Results from the machine tool show weren't immediate, but the strong level of inquiries at present is believed at least partly due to appetites whetted by what customers saw at the show. If they didn't buy a new tool, at least they broke down sufficiently to invest in some later model used equipment.

The run is on production equipment, as opposed to the heavy toolroom business that was being done earlier this year. Heavy lathes, press equipment, milling machines, planers are in strong demand and a supply problem on milling equipment is building up. There just isn't quite enough to meet the going demand.

Prices May Rise . . . Thus far the customer pressure hasn't boosted prices strongly, but it's an increasing hunch that if the current level of activity holds another month, or at the least in 60 days, used machine tool prices will begin to boost.

Part of this is due to the fact that dealer inventories aren't as strong as they should be for the current level of business. Optimists spotted an active fall as early as July, but the fall scramble for used tools thus far hadn't been counted on by most. And a good share of the inventory building done earlier this year by dealers with an eye to the fall market consisted of toolroom equipment.

Big Sellers Cited . . . Presses and shears continue in good demand, and could be marketed in heavier quantities if the supply were stronger. This is a market that hasn't faltered through the entire year, and gives every evidence of continuing at the present hot pace well into next year. Sheet metal equipment is another excellent inventory item that has been turning over too rapidly for any dealer to concentrate heavily on building up his reserve stocks.

Not all dealers will admit to the feeling, but auction prices are building and are another factor in the possible climb in used tool prices before the end of the year. Bidding has been spirited at auctions recently, and in view of current business levels, there's every reason to believe that this trend will continue.

This hasn't been as notable in general toolroom equipment as it has in heavy production equipment of a more specialized nature, but even some potential customers are on the prowl at auctions and in competition with dealers who have a customer of their own already waiting for the piece of equipment that is up for auction.

Out-of-Area Trade Booms . . . Export business is good but the flow of equipment out of the Chicago area to Eastern and Southwestern accounts is outstanding. One dealer figured that last month about 90 pct of his business was with buyers from well out of the area, despite the fact that Chicago plants are undergoing a mild production boom of their own that is matched by a wave of large and small plant expansions.

The outlook for the Midwest: strong as far as customers go, not quite as bright when it comes to locating a new piece of stock for resale.

One of the Largest, Finest and Most Modern Mechanized Foundries in America!

TO BE SOLD, BY ORDER OF THE OWNERS, AT

PUBLIC AUCTION

TUESDAY, WEDNESDAY, THURSDAY & FRIDAY

DECEMBER 6-7-8-9th, 1955

CONSISTING OF

ULTRA-MODERN FOUNDRY, TOOL ROOM, MACHINE SHOP & MATERIAL HANDLING EQUIPMENT

MACHINERY & EQUIPMENT FORMERLY COMPRISING THE

WILSON FOUNDRY & MACHINE CO.

(A DIVISION OF WILLYS MOTORS, INC.)

74 W. WILSON AVE. ● PONTIAC, MICHIGAN

$15,000,000 Replacement Value!

ELECTROMELT FURNACE: Moore Lectromelt Furnace, Type S, Size QT.
ANNEALING FURNACES: 2—Surface Combustion Roller Hearth Recirculating Furnaces. Ind Circulating Air Roller Hearth Furnace. 2—Push Type Furnaces.
CUPOLAS: 4—Whiting No. 10, Model B Cupolas. 4—12,8000 C.F.M. Blowers. 30—Bull Ladles. 5—Tilting Ladles.
OVENS: 5—Coleman Tower Core Ovens. 3—Coleman and Lanly Horizontal Core Ovens. 3—Coleman and P-D Rack Type Core Ovens. 6—Coleman Paste Drying Ovens.
SAND MIXING & RECLAIMING: 4—Clearfield No. 930 Mullers. 2—Simpson No. 25 type B Mullers. National No. 6 Muller, Beardsley & Piper No. 70 and 35½" Sand Mullers. 2—Baker Perkins No. 18½ Sand Mixers. Spiral Mud Mixers. Allis-Chalmers No. 24-10 Core Crusher. Link-Belt No. 502-20 Sand Dryer. Bartlett & Snow Sand Screens. Aireators. 8—Sand Storage Bins Up to 200 Ton Capacity. 10—Bucket Elevators.
SAND SLINGERS: Beardsley & Piper 19" DB with Turn-Table and Sand Bin. 3—Beardsley & Piper Type S. 16" DB Sand Slingers.
CORE BLOWERS: 46—Osborn, International and Champion Core Blowers. From Osborn No. 3502-1 Five Station Automatic to Bench Type. Core Blowers.
ROLLOVERS: 22—International Roll-Overs, 14"x12" and 14"x8" Type R. 7—Asst. Roll-Overs, Up to 12"x32" and 12"x16".
STRIPPERS: 5—Milwaukee No. 620 NDI Power Strippers.
SHAKEOUTS: 19—Robins and Simplicity Shakeouts, 19"x108", 19"x72", 24"x96", 48"x72", 36"x72", 32"x72", 24"x72", 36"x48", and 24"x34" Sizes.
JOLT SQUEEZE: 26—Osborn, International and Milwaukee. Asst. Jolt Squeeze and Jolt Squeeze Strip Molding Machines.
CORE GRINDERS: 2—Milwaukee No. 70-12 and 7—Milwaukee No. 70-9 Rotary Core Grinders.
TUMBLING BARRELS: 12—Tumbling Barrels, Including 2—Wheelabrator 48"x48"x20 Cu. Ft. Tumblasts.
CASTING CLEANING: Pangborn No. E5259 Monorail Conveyor Type Rotoblast 42'6"L.x9'W.x10'H. Also 3—Sand Blasts Cabinet Type.
DUST COLLECTORS: 5—Pangborn No. CH2 and 4—Pangborn No. 220 Type CK Dust Collectors.

MISC. FOUNDRY EQ'PT: 3—Wire Forming Machines. 4—Wire Straightening and Cut-Off Machines. Rod Straightaners. 2000—Flask Sets. 23,000—Core Plates. Flask Bushings. $260,000 of Foundry Machine Repair and Replacement Parts. Alloys, Refractories. 250—Air Hoists. 1250—Foundry and Factory Trucks. 47—Charging Buckets, Etc.
AIR COMPRESSORS: Ingersoll-Rand 5400 C.F.M. 30"x18"x21" Horizontal, 2-Stage, 4-Corner, Type PRE-2-4-C. 1000 H.P. Motor Driven Air Compressor. 2—Ingersoll-Rand 24"x16¼"x18", Type PRE-2, 355 H.P. Motor Driven and Ingersoll-Rand 25"x15½"x18", Type PRE-2, 324 H.P. Motor Driven, 2-Stage, Horizontal Air Compressors, Pennsylvania 6"x6" Horizontal Air Compressor.
CRANES: 2—10 Ton Elect. Traveling Bridge Cranes. 2—5 Ton Elect. Traveling Bridge Cranes, Elect. Monorail Crane. 4—4-Ton Elect. Monorail Charging Cranes. 4—Magnets, Etc.
TRUCKS & TRACTORS: 1-H and Ford Tractors. Hough Payloader. 14—Gas and Electric Fork Up to 7000 lb. Cap. 10—Elect. Platform Lift Trucks. 11—Clark Gas Towing Tractors. 3—Hyd. Lifts. 3—Dump Trucks, 1½, 3½ and 5 Ton Cap. Stake Body and Pick-Up Trucks. Station Wagon and Jeep. 1250—Foundry and Factory Trucks. Garage Equipment.
CONVEYOR: 7900 Ft. of Overhead Chain Conveyor. 1100 Ft. of Mold Car Conveyor. 5760 Ft. of Belt Conveyor. 3100 Ft. of Gravity Conveyor. 500 Ft. of Slat Conveyor.
TOOL ROOM EQ'PT: Rockford 32"x36"x120" Hyd. Open-Side Shaper Planer. Bullard 36" Vertical Turret Lathe. 10—Lathes Up to 42"x192", 5—Milling Machines, Van Norman No. 36, K&T 2K Vert., K&T 3K Plain, K&T 2H Plain. 4—Shapers Including Cincinnati 24" Universal. 11—Radial Drills. 40—Grinders Including Cincinnati No. 2 C&T, Diamond 36" Face, Etc. 19—Welders. Universal Boring Mill. 10—Presses. 15—Drill Presses. Planer. Keyseater. Hammers. Saws. Tappers. M.G. Sets. Wood Working Machinery.
MISCELLANEOUS: 21—Transformers, 1000 K.V.A. to 75 K.V.A. 10,000 Gal. Outside Propane Tank. 100,000 lb. Tool Steel, CRS, HRS, Etc. 10 Ton of Wire. 1000—Tote Pans. Lockers. Benches. Factory Supplies and Equipment. Garage Equipment.
$400,000 of Laboratory Equipment, Precision Tools, Checking Instruments, Perishable Tools and Supplies.

COMPLETELY EQUIPPED X-RAY DEPARTMENT & FIRST AID ROOM

BUSINESS MACHINES • OFFICE FURNITURE • FIXTURES

Write, Wire, Phone for Illustrated Descriptive Circular

SAMUEL L. WINTERNITZ & CO.

Auctioneers • Liquidators • Appraisers Since 1894

FIRST NATIONAL BANK BLDG.
CHICAGO 3, ILL.
Phone STate 2-5908

NATIONAL BANK BLDG.
DETROIT 26, MICH.
Phone WOodward 1-0969

Making Capital of Idle Assets for More than 60 Years!

ROLLING MILLS—STEEL WORKS EQUIPMENT

1—34" & 22" x 112" 3-HIGH PLATE MILL with front and back tilting tables, 1500 HP motor and gear set; also 84" 3-high jump mill on same drive, with tables.
1—30" x 97" BLOOMING OR SLAB MILL, 2-HIGH, reversing.
3—4-HIGH HOT STRIP MILL STANDS for up to 76" width.
1—16" x 24" STRIP MILL, 2-HIGH.
1—20" x 20" 2-HIGH COLD MILL, with motor drive.
1—12" x 12" 2-HIGH COLD MILL, roller bearings.
1—10" x 16" 2-HIGH TANDEM COLD MILL, 3 stands, with D.C. Drives.
1—5" x 8" 2-HIGH COLD MILL.
1—24" BAR MILL, 3-HIGH, 3 stands, with variable speed, D.C. motor, traveling tilting tables, roller tables, saws, bloom shear, furnaces.
1—18" x 60" 3-HIGH BREAKDOWN MILL, 1 roll stand, pinion stand, 500 H.P. motor and controls.
1—9" BAR MILL, 3-HIGH, 4 stands: 2 spare stands.
4—10" BAR MILL STANDS, 2-HIGH, with 400 H.P. motor and controls.
1—4-HIGH SINGLE STAND COLD MILL for strip up to 14" wide.
2—UNITED ALLIGATOR SHEARS, 4" square and 2¾" square.
1—34" x 192" ROLL GRINDER with motors and controls.
1—44" ROLL LATHE, enclosed headstock, tailstock, plano rest, 20 H.P. 500/1500 RPM, 230 volts D.C. motor and controls.
2—PACK FURNACES for hot sheet mills, 62" x 66", double chamber.
1—SIAMCO #6 CORRUGATING MACHINE for sheets, removable dies.
16—AJAX electric induction melting furnaces, 2000 lbs. each.
1—6-TON HEROULT electric melting furnace, top charge.
1—UNITED #4 vertical open-side bar shear.
1—PLATE SHEAR, capacity 1" x 144".
2—DRAWBENCHES, 50,000 lb. and 20,000 lb. capacities.
1—COKE OVEN PUSHER, used very little, excellent condition.
1—BONNOT-LENTZ BILLETEER, Size "A," maximum capacity 9" x 9".
1—125-TON LADLE CRANE 25-ton auxiliary, 50' span.
1—100 TON CRANE, 60' span, 25 ton auxiliary.
1—500 HP MOTOR, 120 RPM, 2200/3/60 with control.
1—400 HP MOTOR, 327 RPM, 2200/3/60 with control.
1—1800 HP GEAR DRIVE, ratio 19 to 1.
1—500 HP GEAR DRIVE, ratio 7.63 to 1.
1—SCRAP BALER, box size 84" x 18" x 36".
4—TINNING UNITS for hot dipped tin plate.
1—PICKLING MACHINE for sheets, Taylor design.

FRANK B. FOSTER, INC.

2220 Oliver Building, Pittsburgh 22, Pa.
Cable: "Foster, Pittsburgh" Telephone ATlantic 1-2780

SELECT MACHINE TOOLS

GRINDING MACHINES
60" No. 16A2 Blanchard 2-spd. rotary, new 1946.
72" Hanchett 3-spd. rotary surface, new 1946.
12" x 48" Norton universal cylindrical, late.
16" x 96" Landis gap type cylindrical, new 1941.
15" x 60" Model 500 Hanchett vert. spdl., late.

HAMMERS
No. 6-1 Nazel, pneumatic, late.
No. 3N Nazel, self-contained.
No. 0B Nazel, self-contained.

LATHES
18"/36" x 60" cs Nobel gap lathe, 1941.
20" x 62" Axelson H.D. engine lathe, late.
24" x 8' LeBlond H.D. engine lathe.
No. 5 Jones & Lamson ram type univ., turret.
14" x 6' Hendey Toolroom, 1940.
15" x 30" Lipe Carbe-Matic, 1942.

MILLS
1-18 Cincinnati production.
Model 2-20 Kent-Owens hyd. mill, late (2).
60" x 48" x 10' Ingersoll adj., rail planer type.
No. 2H K & T plain horiz., new 1942.

PLANERS
36" and 60" Rockford Hyd. Openside Shaper-Planers.
48" x 48" x 10' Gray Maxi-Service.

PRESSES
250 ton No. 7905½-72 Toledo D.C. Toggle drawing.
500 ton No. 1030 Hamilton D.C. adj. bed, 60"x102".
545 ton No. H3612½ Hamilton Forging Press.
1000 ton No. 600 Toledo coining or forging.

SHAPERS
24" Rockford "Hy-Draulic" universal.
32" G & E Invincible, F.M.D., late type.

SHEARS
50"x 3/16" Bertsch power squaring shear, 18" gap.
96" x 10 GA Bliss power squaring shear.

UPSETTERS
2" National Upsetter.
3½" Ajax, suspended slides, steel frame.
5" Ajax suspended slides, steel frame, air clutch.

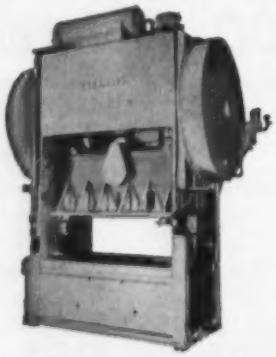
1000 Tools in Stock

Free Illustrated Catalog

MILES MACHINERY CO.
Phone Saginaw 2-3105
2041 E. Genesee Ave. Saginaw, Mich.

WORLD'S LARGEST STOCK STAMPING PRESSES

BLISS • CLEARING • CLEVELAND
FERRACUTE • HAMILTON • L & J
NIAGARA • TOLEDO • V & O



SQUARING SHEARS • PRESS BRAKES
REBUILT and GUARANTEED

JOSEPH HYMAN & SONS
TIOGA, LIVINGSTON & ALMOND STS.
PHILADELPHIA 34, PA. Phone GArfield 3-8700

3¾" Late Type Defiance Horizontal Table Type Boring Machine Serial #921-39
#24 Tri-Way 3" Universal Boring Mill Serial T2430
2 3-4 Spindle Leland Gifford Drills
#300 Hanchett Vertical Surface Grinder Serial #300-17
DB 2112-A Excello Single End Boramatic Ser. #10160
#47 Heald Single End Boramatic Serial #4646
(2) Greenfield #28 Hydraulic Internal Grinders Serials #1-11-11902 and F4-11235
7A Jones & Lamson Turret Lathe Serial #60469
#72A 3 Heald Sizematic Internal Grinders Serial #12276
Late Type 12"x 48" Landis Type C Universal Hydraulic Cylindrical Grinder Ser. #17898
(2) 24' x 8' x 10" Thick T slotted Floor Plates
(2) 20' x 6' x 14" Thick Layout Plates. Plain no T slots.

HAZARD BROWNELL MACHINE TOOLS, INC.
350 Waterman St. Providence 6, R. I.
Dexter 1-8880

AIR COMPRESSORS
410 CFM Inger. Rand 908 — 100 HP — 440 V.
780' Inger. Rand XRE2 — 125 HP — 4160 V.
780' Inger. Rand XLE 220/440 V. — New 1953
1578' Inger. Rand PRE2 — 4100/2300 V.
2—2874' Inger. Rand PRE2 — 478 HP — 2300 V.
DIESEL ELEC. LOCOMOTIVES
9 G.E. 25, 35, 45, 65, 70 & 100 Ton
8—8000 GAL. ALUMINUM TANKS
Heavy Horiz. Welded ½ in & ⅝ in. Thick
3—42 x 36 METAL TURNINGS CRUSHERS
3 Jeffrey MT-26 With 125 H.P. Motors
DIESEL LOCOMOTIVE CRANES
1—25 Ton Amer. & 1—25 Ton Orton
STEEL SHEET PILING
3500 Tons Carnegie M116-MP112—30/40 Ft.

THE DARIEN CORPORATION
60 E. 42nd St., N. Y. 17, N. Y.

12" PIPE BENDER

Federal, 2" to 12" cap., Cold, No Filling or heating, 50 H.P. 3/440 motor. 29 shoes. Mandrel Type.

Republic MACHINERY COMPANY
THOS. J. O'BRIEN, PRES.
134 N. 3RD ST., PHILA. 6, PA.
Walnut 3-8013

Sutton #2—Two Way Flat and Shape Straightener

For flats, squares, hexagons, angles, and channels.

Wickes—Flattening Roll

48" with hydraulic controlled pressure rolls.

Acme Equipment Co., Inc.
126-128 South Clinton St., Chicago 6, Illinois
Tel. ANdover 3-3430

PUBLIC AUCTION

KNICKERBOCKER STAMPING

Complete stamping plant at Parkersburgh, West Virginia, having 35 presses, gap, horning, arch, straight side, O.B.I., punch and brake, from 20 to 126 ton, shears, spot and butt welders, galv. pots, sand blast, ovens, etc.

Date of Sale—December 6, 1955—Inspection from November 7th to date of sale. Ask for brochure, Hetz Industries, P. O. Box 671, Warren, Ohio.

CONSIDER GOOD USED EQUIPMENT FIRST

ANGLE BENDING ROLLS
No. 2 Niagara Angle Bending Roll
No. 2 Buffalo Angle Bending Roll

BALER
#128-TC Galland Henning, Volume of Box 145 cu. ft., Bale Size 500 to 800 lbs.

BENDING ROLLS
6' x 3/16" Bertsch Initial Type
12' x ¾" Niles Pyramid Type
10' x ¾" Bertsch Initial Type Bending Roll
18' x ¾" Wickes Pyramid Type
20' x 1" Hilles & Jones Pyramid Type Bending Roll

BRAKES—LEAF TYPE
8' x ¼" Dreis & Krump Size 186
12' x ⅛" Dreis & Krump, Motor Driven

BRAKE—PRESS TYPE
12' All Steel Press Brake, 250 ton Capacity

BROACH
Model VP-4-40-40 American Vertical Hydr. Broach, Max. Capacity 60 ton, Stroke 40", Motor Drive

BULLDOZER
#9 W&W Mechanical Bulldozer, 28" Stroke, Face of Crosshead 24"x20"x168", 50 H.P. A.C. Motor

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H	29' Span 230 Volt D.C.
5 ton Northern	50' Span 230 Volt D.C.
5 ton Northern	57' Span 220/3/60 A.C.
5 ton Cleveland	90' Span 230 Volt D.C.
7½ ton P&H	65' Span 440/3/60 A.C.
10 ton Niles	52' Span 230 Volt D.C.
10 ton P&H	90' Span 230 Volt D.C.
15 ton P&H	50' Span 230 Volt D.C.
20 ton P&H	60' Span 230 Volt D.C.
20 ton Toledo	75' Span 550/3/60 A.C.
30 ton Shaw	70' Span 230 Volt D.C.
130 ton Whiting With 10 ton Auxiliary	80' Span 220/3/60 A.C.

FORGING MACHINES
1" to 5" Acme, Ajax, National
1", 4", 5", 7½" National High Duty, Air Clutch

FURNACES
Lee Wilson Natural Gas Annealing Furnace, Work Dimensions 42" coil, 96" Piling Height
Westinghouse Bell Type Furnace, Gas Fired, Charge Space 36" dia. x 42" deep
Ther-Monic Induction Heater Model 1400
15 ton Herault Top Charge, With Transformer

HAMMERS—BOARD DROP—STEAM DROP STEAM FORGING—800 lb. to 20,000 lb.

JIG BORER
#50 Knight Jig Borer, Complete—New 1950

LEVELERS—ROLLER
52" McKay 17 Rolls 3⅝" Dia.
60" Aetna Standard 17 Rolls 4⅛" Dia.
72" McKay 15 Rolls 4½" Dia.

PRESSES—HYDRAULIC
500 ton HPM Fastraverse Press, 24" Stroke Pressing Area 36"x36", Max. Daylite 42"
1357 ton Baldwin Southwark Forging Press, 30" Stroke Main Ram, 54" x 41" Bet. Columns
3045 ton Birdsboro, 4-Columns, 16" Stroke Platen 42" x 40", Daylite 47"
4500 ton B-L-H Hydr. Forging Press

PRESS—TRANSFER
Baird 12 Station Model 4-37 Automatic Multiple Transfer Press, 30 ton Capacity

PUNCH & SHEAR COMBINATIONS
#1½ Buffalo Universal Ironworker
Style EF Cleveland, 36" Throat, Punch 1¼" thru 1"
Style W Cleveland Single End, 60" Throat, 31½ Ton

ROLL—PLATE STRAIGHTENING
84" Hilles & Jones, Six Rolls 10" Dia., M.D.

ROLLING MILLS
12" x 20" Garrison & W-F Two Stand Two High
12" x 20" Garrison Single Stand Two High
13" x 24" Garrison Single Stand Two High
16" x 24" Farrel F&M Two Stand Two High
20" x 32" Hoagland Single Stand Two High
24" x 44" Garrison Two High Hot Mill

ROLLS—FORMING
10 Stand Tishken MLW-1½, Spindle 1½" Dia.
8 Stand Rafter Tube Forming Machine, Spindle 1⅜"

SHEAR—GATE
80" x ¾" Pels

SHEAR—ANGLE
6x6x1" Long & Allstatter Size B

SHEARS—BAR
#9 Buffalo Bar Cutter, Capacity 2" Sq., 3⅜" Rd.
#4 H&J Guillotine, Capacity 3½" Square, 4" Round

SHEARS—ROTARY
3-16" Quickwork Rotary Shear, 36" Throat
¼" Kling #250, With Flanging Attachment
½" Quickwork Whiting #04A—NEW 1953
⅝" Kling #750, 48" Throat, Circle Cutting Attach.
1" Kling No. 100, 48" Throat, Jogging Rolls Incl.

SHEARS—SQUARING
10' x 12 Ga. Niagara No. 501B
10' x ⅛" Niagara Model L-10-⅛

SLITTERS
36" Yoder Slitting Line with Coilers
36" Parson Coil & Sheet Slitter
36" Custom Built Slitting Line, with Coilers & Leveler

STRAIGHTENERS
Kane & Roach 5-Roll, Capacity ⅜" to 1½" dia.
Taylor Wilson Cross Roll, Capy. ⅜" to 1½" Bars
No. 2 Medart 3-Roll Rotary Straightener Capacity 1" to 3½" bars or up to 4½" tubes
¾" Halidon #3, With 20 ft. Cut-Off

TESTING MACHINE
5,000, 10,000, 100,000, 200,000# Olsen & Richle Universal; 50,000 & 300,000# Compression

A. T. HENRY & COMPANY, INC.
Manufacturing Equipment
50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7 3437

Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

1½" Ajax Upsetting & Forg. Machine, air clutch, latest type, built 1949

4" National Upsetter High Duty, guided overarm slide, air clutch

Ajax & National Upsetters, suspended slide, 1", 1½", 2", 3", 4"; similar upsetters not suspended slides

700-ton Ajax High Speed Forging Press

500-ton National Maxipres

Kling No. 6 Bar & Billet Shear, 6" rd.

Hilles & Jones and Buffalo Shears 1½", 2", 2½", 3", 3¼", 4" and 4¼"

1600 & 2500# Chambersburg Model F Board Drop Hammers, Roller bearing; double V-ways. Built 1943

4000# Niles Bement Double Frame Steam Forg. Hammer

Bradley Hammers, all sizes, including 500# Upright

Nazel Air Forging Hammers, #2-B, 4-B, 5-N

Williams White Bulldozers, #22, #3, #4, #25, #6, #29 U-type

300-ton Oilgear High Speed Hydraulic Press, Ram 27" x 23"

Landis Landmaco and other Landis Threading Machines from ⅜ to 4"

Single and Double End Punches

Multiple Punches

Plate Shears

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.
1913 W. 74th Street, Chicago 36, Ill.

STEEL

for immediate shipment from stock

SHEET PILING (I-27)

60 Tons 16" @ 36# x 14'/35'

XX BEAMS

(Imported)

280 Tons 8" @ 17.9# x 36', 38' & 40'

ANGLES

110 Tons 2½" x 2½" x ⅜" (C1045) x 20'/65'
110 Tons 5" x 5" x ½" to 8" x 8" x 1" (C1020) x 20'/37'

FLOOR PLATES

140 Tons 14 Ga. to ½" x 48"/72" x 8'/30'

ALSO LARGE STOCKS OF STRUCTURAL SHAPES
PLATES—BARS—REINFORCING RODS & MESH

CALUMET IRON & SUPPLY CO. CALISCO SINCE 1926

Phones:
CHICAGO, ILL. REG. 4-6020
EAST CHICAGO, IND. 1868

175 WEST CHICAGO AVE.
EAST CHICAGO, INDIANA

---

250 KW MG Set, GE 230 VDC, 220 AC.
800 HP Motor West. CW, 870, 2200 AC.
60 HP Motor Allis C. TEFC 870, 440 AC.
10 HP GE GEARMOTOR 230 DC, 63 RPM.
7½ HP Motor West SK, 1750 RPM, 120 DC.

F H CRAWFORD & CO., INC.
30 Church St., New York 7, N. Y.

Fosdick 4-spin. No. 5BMA Drill, P.F.
Gleason 3" Str. Bevel Gear Gens.
Cinn. 6" x 30" Model EA Grinder.
No. 2 B & S Turret Lathe, elect. head.

D. E. DONY MACHINERY CO.
4357 St. Paul Blvd. Rochester 17, N. Y.

No. 27 Williams & White Bulldozer for Sale

180 Ton capacity, double back geared, twin driving gears, machine serial No. 634G. Equipped with 50 HP 230 V. motor & starter.

ANOTHER EXCELLENT MILES VALUE

MILES MACHINERY CO.
2064 E. Genesee Ave. Saginaw, Michigan

eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

PLANERS

P10 Coulter Crank Type Shaper-Planer, 1 head, m.d.
24" x 24" x 6' Ohio Standard Pattern Planer, m.d.
30" x 30" x 8' Cincinnati, belted m.d., 2 rail heads
30" x 30" x 10' Cincinnati, belted m.d., 2 heads
36" x 36" x 8' Cincinnati, m.d., 2 heads on rail
36" x 36" x 10' Betts, belted m.d., 2 heads on rail, 2 side heads
36" x 36" x 10' Gray, Extra Heavy Pattern, m.d., 2 heads on rail
36" x 36" x 10' Niles-Bement-Pond, belted m.d., 1 head on cross rail
36" x 36" x 12' Betts, m.d., 2 heads
36" x 36" x 12' Gray, 3 heads
36" x 36" x 20' Cincinnati, 2 heads, belt
36" x 36" x 20' Gray Extra Heavy, belt, 2 heads on rail
36" widened to 42" x 36" x 20' Cincinnati, m.d., 2 rail heads, 1 side head
36" x 36" x 30' Cincinnati, m.d., 4 heads
42" x 42" x 26' G. A. Gray, 2 heads, belted m.d.
48" x 48" x 12' Cincinnati, 4 heads
48" x 48" x 18' Niles-Bement-Pond, 2 heads, belt
48" x 48" x 18' Detrick & Harvey, 4 heads, reversing m.d.
48" x 48" x 28' Cincinnati, reversing m.d., 4 heads
56" x 42" x 14' Cincinnati, belted m.d., 2 heads

RAILROAD MACHINERY

No. 2 Niles-Bement-Pond Axle Lathe, m.d.
No. 3 Niles-Bement-Pond Axle Lathe, m.d.
48" Niles-Bement-Pond Car Wheel Borer, m.d.
52" Betts Car Wheel Borer
90" Niles Balanced Quartering & Crank Pin Turning Machine, latest
90" Putnam Driving Wheel Lathe, m.d.
90" Niles Journal Lathe, including 2 inside journal turrets and 3½" spindle double quartering attachment, m.d.
90" Niles Driving Wheel Lathe, m.d., latest
Niles-Bement-Pond Quartering Machine, m.d., new
No. 3 Betts Bridgeford Axle Lathe, m.d.
Betts-Bridgeford Combination Journal Truing & Axle Lathe, 3 carriages

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1241 CABLE ADDRESS—EMCO

7½" BAR, PLANER TYPE INGERSOLL HORIZONTAL BORING, DRILLING & MILLING MACHINE

Table 60" x 120"
Motor & Controls
Rebuilt

LANG MACHINERY COMPANY
28th St. & A.V.R.R. Pittsburgh 22, Pa.

IMMEDIATE DELIVERY

FERRACUTE SD-703 Double Action Toggle Draw Press 700 Ton Cap., Bed Area 60" F.B. x 72" L.R., Stroke of Plunger 40", Stroke of Blankholder 20", 100 H.P. Motor.
BLISS No. 88 Straight Side Single Crank Press, Capacity 255 tons, Bed Area 30" & 29", 18" Stroke of Slide, Marquette Air Cushion.
TOLEDO Double Cranks, Nos. 91-42, 92C.
CLEVELAND Double Cranks, 65-G-72, 48-D-48.
NIAGARA Double Cranks, 67C, 698X.
BLISS Nos. 4, 22K, and 24K Knuckle Joint Presses.

"If it's machinery we have it."

NATIONAL MACHINERY EXCHANGE
128 Mott St. New York 13, N. Y.
CAnal 6-2470

FOR SALE

Freight car repair parts
Relaying rails
Steel storage tanks
Freight cars and Locomotives

ALSO

2—42" Bullard Spiral Drive Vertical Turret Lathes—1944
1—42" Bullard Vertical Turret Lathe, New Era
Contracting Equipment
Cranes — Tractors
Ditchers — Compressors
Diesel Engines and Generating Sets

THE PURDY COMPANY
8754 S. Dobson Ave.
Chicago 19, Illinois
St. Louis, Mo. So. San Francisco, Calif.
Los Angeles, Calif.

FOR SALE

11—75 ton capacity double hook blocks with 24" Roller Bearing sheaves with 3150# weight block (detachable). Mfg. Sauerman Bros. Model C-7210.

100—30 long ton and 40—10 long ton safe working load Timken Roller Bearing Hooks. Other Sizes Also Available.

WEbster 8-2701

Western Machinery Co.
8161 W. 3rd St., Los Angeles 48, Calif.

FOR SALE

Completely overhauled Roots-Connersville Blower, 3200 CFM; max. capacity. Will sell for $1000.00—F.O.B. Alpena, Michigan. Price does not include motor. Write to Thunder Bay Mfg. Corporation, P. O. Box 317, Alpena, Michigan.

#1 & #2 Buffalo Forge Vertical Bending Rolls. Leg-in Attachment. Late Type.
#½ & #1½ Buffalo Universal Ironworker. Coper, Notcher. Late Type.

FALK MACHINERY COMPANY
18 Ward St. Baker 5887 Rochester 5, N. Y.

FOR SALE

10—Koppel and Western 30 cu. yd. Air Dump Cars. Lift type doors with side aprons. All steel. Bargain.
80 ton General Electric diesel electric locomotive 500 HP Cummins engines. Built 1947.
80 ton Whitcomb diesel electric locomotive 500 HP Cummins engines. Rebuilt.
44 ton General Electric diesel electric locomotive 380 HP Caterpillar engs. 4 motor type.

Mississippi Valley Equipment Co.
501 Locust St. St. Louis 1, Mo.

FOR SALE

One 3-ton Heroult Electric Arc Furnace complete with transformer, new control panel and switches.
25 sets Shanmefelt Steel Flasks, 41" x 47", 18" cope, 8" drag.
20 sets 30" x 38" Flasks, 14" cope, 8" drag.
7 sets 48" x 50" Flasks, 15" cope, 15" drag.
ALL NEW. NEVER USED.

ADDRESS BOX G-183
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

LARGE MACHINE AND WELDMENT CAPACITY

Open capacity on 24 ft. and 10 ft. Vertical Boring Mills 7", 5" and 4" Horizontal Boring Mills; large radials and supporting small machines including new 2 AC Warner & Swasey automatic chucking. Especially interested in producing weldments requiring machining.

C. H. Wheeler Manufacturing Co.
Sedgley Avenue at 19th & Lehigh, Philadelphia 32, Pa.
Phone: Henry Kingston—Sagamore 2-6500

FOR SALE

2 #1B J. D. Wallace Radial Saws
2 H.P. 220/440 AC Freq. 60 3 Phase G.E. 3450 RPM included 2 shop tables, 4 8" curl chip blades

GLOBE AMERICAN CORP. MACOMB DIVISION
MACOMB, ILLINOIS

LIFTING MAGNETS

A complete magnet service. Magnets, new & rebuilt, generators, controllers, reels, etc.

Magnet specialists since 1910

Goodman Electric Machinery Co.
1060 Broad St. Newark 2, N. J.

50"-72" CLEVELAND CRADLE TYPE UNCOILERS FOR SALE

50"-72" x 52" diameter capacity, hydraulic drive motors with pumps. Two in stock.

ANOTHER EXCELLENT MILES VALUE

MILES MACHINERY CO.
2064 E. Genesee Ave. Saginaw, Michigan

BENNETT MACHINERY CO.

1—84" KING VERT. BOR. MILL

New 1943—3 Hds.; 88" swing, 60" ram travel; 70" under rail, wt. 98000 lbs.
(Send for list of 200 stock tools)

375 Allwood Rd., Clifton, New Jersey

Locomotive Cranes, Diesel, Gas, Electric, Steam
Locomotives, Standard & Narrow Gauge
Gantry, Rubber mounted and crawler cranes
Derricks & Hoists
Whirley Cranes
Railroad Cars

STONE, THE CRANE MAN
932 Prudential Bldg., Buffalo 3, N. Y. Mohawk 4494

Overhead Cranes & Hoists

NEW & USED

10-ton Case Crane, 56' 11" span, 3-motor, 220/3/60, floor controlled, pendant type, box girders, excellent condition—inspection under power—sacrifice price for immediate sale before storing same.

Available 100 cranes various spans, tonnages and current.

JAMES P. ARMEL — Crane Specialist

710 House Bldg. Pittsburgh, Pa.
Tele: Gr. 1-4449

CRANES

BOUGHT & SOLD

ENGINEERED TO YOUR REQUIREMENTS

Ornitz Equipment Corp.

Industrial Engineering Service
220 3rd Ave. Brooklyn 17, N. Y.
TRiangle 5-2553

RAILS

FOR IMMEDIATE DELIVERY

600 Tons 80# ASCE	Relay
400 Tons 90# ARA-B	Relay
150 Tons 90# ASCE	Relay

TIE PLATES • Excellent Relay
TURNOUTS—LIGHT RAILS
TRACK ACCESSORIES

MORRISON RAILWAY SUPPLY CORP.

814 Rand Bldg. Buffalo 3, N. Y.
MOhawk 5820

USED MILD PLATES

Excellent condition. Various sizes from 3/16" to 1.00"

FREIGHT CARS
CAR PARTS, RAILS

Consolidated Ry. Equipment Co.
105 S. La Salle St., Chicago 3, Ill.

MOTORS · GENERATORS
TRANSFORMERS
NEW · REBUILT
WORLD'S LARGEST INVENTORY
ELECTRIC EQUIPMENT CO.
PHONE STATION COLLECT GL 6783
P.O. BOX 51 ROCHESTER 1, NEW YORK

MACHINES FOR YOUR YARD

Unit 1020A Diesel crawler crane
Lorain 10 ton crawler crane
Harris "Power Horse"; 2½ yd. bucket
Eagle coal crusher
Clayton-Kerrick steam cleaner
Galion motor grader

TRACTOR & EQUIPMENT CO.
10806 Southwest Highway, Oak Lawn, Ill.

SQUIRREL CAGE MOTORS

3 phase, 60 cycle, 220 or 440 volts (*2300 volts or higher)

HP	Make	Type	Speed
1250	*Al.-Ch.	ANW	3600
1250	*Al.-Ch.	ANW	1200
800	*Westg.	CS	3600
800	*Westg.	CS-1485	1800
700	*Westg.	CS	1200
700	Al.-Ch.	AN	900
500	*Al.-Ch.	6316-8W	1800
500	G.E.	KT-424	450
400	G.E.	KT-424	360
350	Ideal	A	1800
300	*G.E.	K-6344Y	1200
300	G.E.	K-6353 TEFC	720
250	G.E.	KT-5998	1800
250	*L-Allis	OGK-148	720

CHICAGO ELECTRIC CO.
1335 W. Cermak Rd., Chicago 8, Ill.

LAND

EST. 1910

ELECTRICAL EQUIPMENT

A.C. & D.C.

MOTORS AND GENERATORS
One of America's Largest Stocks
RELIABLY REBUILT
IN OUR OWN SHOP
1 YEAR GUARANTEE
Send us your inquiries

L. J. LAND INC.

150 GRAND ST., NEW YORK 13, N. Y.
Phone: CAnal 6-6976

DC CRANE MOTORS

230V. SERIES

80 HP	GE	MD-106	550RPM	
50	GE	CO-1811	450	
40	GE	CO-1810	420	
35	GE	COM1829	925	
35	GE	COM1828	1150	
25	West	K-8	550	550V.
15	GE	CO-1807	600	
15	West	K-5	650	
10	GE	COM1825	975	
10	GE	CO-1806	600	
7½	West	K-4	850	550V.
7½	GE	COM1824	800	
5	GE	CO-1804	800	
5	West	K-2	715	
4	GE	COM1822	875	
3	GE	CO-1803	750	

Above all in good condition. Reasonable prices. Many other bargains in large AC Motors & MG Sets.

S. M. DAVIS, 510 LaSalle St., St. Louis 4, Mo.

5" AJAX UPSETTER FOR SALE

Steel frame machine, air clutch, reinforcing tierods, swinging stock stop, die hold-downs, arr. for side shear, arr. for M.D., serial No. 3592. Excellent condition—Low Price.

MILES MACHINERY CO.
2064 E. Genesee Ave. Saginaw, Michigan

PRESSURE ACCUMULATOR
VERTICAL, DEAD WEIGHT, HYDRAULIC

Plunger 3" diameter. Stroke 44"
Overall height 13'6"
Dead weight of plunger approx. 22 tons
Working pressure approx. 6500 P.S.I.

MURRAY TUBE WORKS

P.O. Box 476 Elizabeth, N. J.
ELizabeth 4-1200

Immediate Delivery

Used Swindell-Dressler

ELECTRIC ARC FURNACE

With Transformers, Switchgear, Controls, Etc.
11' 6" Shell Diam. Melting Rate 6 Ton Per Hour

Fabrikant Steel Products, Inc.
233 Broadway • New York, N. Y.

OFFERING

BRIDGE CRANES

ARNOLD HUGHES COMPANY
765 Penobscot Bldg. Detroit, Mich.
WOodward 1-1894

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
A. C. MOTORS
3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1500	G.E.	MT-481	2300	360
1	1000	A.C.	MIII	2300	240
1	800	G.E.	MT	2300	292
1	700	A.C.		2300	500
1	500	G.E.	MT-413	2300	585
1	500	Whse.	CW	550	350
1	500	G.E.	M-509Z	2200	1160
1	400	G.E.	IE-17B	2200	885
1	400	Whse.	CW-900A	440	1170
1	400	Whse.	CW	440	514
1	400	Whse.	CW-1213	2200	435
1	300	G.E.	MT-443Y	2300/4000	353
3	250	G.E.	1M-17A	440/2200	730
1	250	G.E.	MT-424Y	4000	257
1	250	G.E.	MT-5348	2200	1800
1	250	Al. Ch.		550	600
1	200	Cr. Wh.	26QB	440	565
1	200	G.E.	IM	440	435
1	150 (unused)	Whse.	CW	2300	435
2	125	A.C.		440	865
1	125	Al. Ch.		440	730
1	100	G.E.	IM-16	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

SQUIRREL CAGE

1	800	G.E.	KT-578	2200	1180
2	500	G.E.	FT-559BY	440	3570
1	500	G.E.	K-6345-S	2300	1185
2	450	Whse.	CS-1420	2300/4150	854
1	400	G.E.	IE-15B	2200	1165
1	400	G.E.	IK	2200	590
1	200	G.E.	IK-17	440	580
8	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440/200/450	
1	150	Whse.	CS-856B	440	880
1	150	Whse.	CS	440	580
3	125	Al. Ch.	ARW	2200	1750
1	100	Whse.	CS-876C-TEFC	440	710

SYNCHRONOUS

1	4350	C.W	3501-8L	13800/6900	514
2	2000	Whse.		2300	120
3	1750	G.E.	ATI	2300	3600
3	735	G.E.	ATI	2300/13800	600
1	500	Ideal	6M	2300/4160	1800
3	500	G.E.	TS-7587	2300	1200
1	450	Whse.		2200	138.5
1	450	Whse.		2300	450
1	400	G.E.	TS-7565	2300	1200
1	400	G.E.	TS	2300	600

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

REBUILT—GUARANTEED
ELECTRICAL EQUIPMENT

SLIP RING MOTORS

Constant Duty, 3-phase, 60 cycle

Qu.	H.P.	Make	Type	Volts	R.P.M.
1	3500	G.E.	MT-	2300	240
1	2000	G.E.	MT	6600	600
1	1250	Whse.	CW	6600	593
1	1250	G.E.	MT	2300	357
1	750	G.E.	I-M	2300	400
1	600	Whse.	CW	2300	444
1	500	G.E.	MT	6600	600
1	500	Al. Ch.	ANY	2200	514
1	500	G.E.	I-M	2300	450
1	400	G.E.	I-M	2300	900
1	400	Al. Ch.	ANY	2200	514
1	400	G.E.	MT	2300	360
1	250	Al. Ch.	ANY	2200	440
1	250	Al. Ch.	ARY	440	735
1	250	G.E.	MT	2300	300

We can supply complete control with any of these.

SQUIRREL CAGE MOTORS

3 Phase, 60 cycle

Qu.	H.P.	Make	Type	Volts	R.P.M.
1	400	G.E.	IK	2300	514
1	200	Whse.	CS-879	2300	1160
1	200	Al. Ch.	AR	440/220	600
1	150	Whse.	CS	440/220	600
1	125	Al. Ch.	AR	2300	495
1	100	Al. Ch.	AR	2300	895
1	100	Al. Ch.	AR	2200	495

SYNCHRONOUS MOTORS

3-Phase, 60-Cycle

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
2	2100	G.E.	unity	2300	360
3	2000	G.E.	80%	2200	720
1	750	G.E.	80%	2300	450
1	710	G.E.	80%	2200	720
2	700	G.E.	80%	2300	1200
2	600	G.E.	unity	2300	327
1	250	G.E.	80%	2300	514
1	250	G.E.	80%	440	450
2	200	Whse.	80%	440	1200
1	200	G.E.	80%	440	450
1	150	G.E.	80%	2300	900
1	150	Whse.	80%	440/220	450
2	125	G.E.	80%	4000/2200	900
3	125	Elec. Mstr.	80%	4800/2400	900
2	100	Whse.	80%	440/220	1800
2	100	G.E.	80%	440/220	600
1	100	Elec. Mstr.	unity	440/220	360

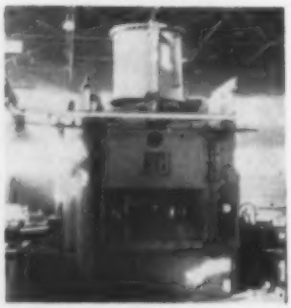
T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 40, Penna.

Cable Address	Phone
"Macsteel" Philadelphia, Pa.	Davenport 4-8300

THE CLEARING HOUSE

5000 TONS
HYDRAULIC HOBBING PRESS
NEW 1952



CAPACITY IN TONS	5000
MAIN RAM DIAMETER	50½"
STROKE	15"
DAYLIGHT	27"
PRESSURE	5000 P.S.I.
TABLE	40" x 52"

Can be inspected in operation

PATHEX (CANADA) LIMITED
107 Tycos Drive, Toronto, Ontario
Phone OR 7232 Cable Patexco

TRACK SUPPLIES — RAILS

ALSO IN STOCK
STEEL
SHEETS & PLATES
STRUCTURALS
and Aluminum Products

New **RAILS** *Relaying*

TRACKWORK of all KINDS
LIGHT RAILS—12# TO 60#—20'0" & 30'0"
HEAVY RAILS—60# TO 100#—30'0" & 33'0"
JOINT BARS, BOLTS, TIE PLATES, SPIKES & TOOLS, FROGS, SWITCHES, STANDARD & SPECIAL TRACKWORK.

SEND US YOUR INQUIRIES

KASLE STEEL CORPORATION
BOX 536 ROOSEVELT PARK ANNEX, DETROIT 32, MICH.—PHONE TIFFANY 6-4300

Save on Your INDUSTRIAL TRACK

FOSTER *QUALITY* — FULLY GUARANTEED

RELAYING RAILS

Handle more cars better—cost less to install and maintain. Foster stocks all Rail Sections 12# thru 175#, Switch Material and Track Accessories.

SEND FOR CATALOGS

RAILS - TRACK EQUIPMENT - PIPE - PILING
L. B. FOSTER CO.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

FOR SALE
SUBJECT TO PRIOR SALE
Auto Parts — New
Popular Model Steering Sectors
Shackle Parts
Model "A" Distributor Parts
Listing on request
AIRTEX PRODUCTS, INC.
Frank O. Putnick, Director of Purchases
FAIRFIELD, ILLINOIS

FOR SALE
38,000# C. D. SEAMLESS TUBES
3⅜" O. D. X ½" WALL X 15 FT.
LOW CARBON $6.50 CWT.
WALLACK BROS.
7400 SOUTH DAMEN AVE., CHICAGO 36, ILL.

New **RAILS** *Relaying*
We carry frogs, switches, spikes and bolts in stock and most all sections of rails and track accessories.
M. K. FRANK
480 Lexington Ave., New York, N. Y.
Park Building, Pittsburgh, Pa.
105 Lake St., Reno, Nevada

FOR SALE—STEEL
86 bars 10-12 ft 2 9/16" O.D. C.F. Rounds, AISI B 1113—6½¢ per lb. F.O.B. Mars, Pa.
MARS MFG. & MACHINE CO., Mars, Pa.

FOR SALE
Fine 8½ x 8 in. threading type Goss and DeLeeuw chucking machine. Late serial complete less chucks.
J. E. BULLOCK CO.
19449 Jos. Cousens, Detroit 35, Mich.
Broadway 3-1211

FOR SALE
Very good Cranes for scrap metal yards.
L-95—2 yd. Lorain Cat. D 13000 Diesel 95 ft. boom.
1½ yd. Asgood, Cummins Diesel, 60 ft. boom.
1 yd. 301 Koehring Gas Power. 60 ft. boom.
The above priced right and ready to go to work.
JAMES E. SHELDON
2244 Third St., Easton, Pa.
Tel. 20385

These are the rates that apply for space in the

Clearing House Section
Equipment and Materials Wanted Section
Contract Manufacturing Section
Business Opportunities Section

	1 Time	3 Times	6 Times	12 Times	24 Times	52 Times
1 inch	$ 12.25	$ 11.55	$ 10.95	$ 10.20	$ 9.60	$ 9.00
2 inches	23.75	21.90	20.40	19.20	18.00	17.20
3 inches	34.55	32.85	30.60	27.00	27.00	26.00
4 inches	46.10	40.80	38.40	36.00	34.55	32.65
5 inches	57.60	51.00	45.00	45.00	43.20	40.80
6 inches	65.50	61.20	54.00	54.00	51.85	48.95
8 inches	87.35	76.80	72.00	69.15	65.30	60.85
10 inches	110.00	90.00	90.00	86.35	82.00	76.00
15 inches	153.00	135.00	129.50	122.50	114.00	108.00
30 inches (Full Page)	270.00	259.00	245.00	228.00	216.00	204.00

SEALED PROPOSALS for the purchase of structural steel and shapes offered for sale by Panama Canal Company under invitation 197, 1990 net tons of ferrous scrap under invitation 198, two steam locomotives and locomotive crane under invitation 199, tubes, plates, mesh under invitation 200, and 226,675 pounds of non-ferrous scrap under invitation 201 will be received by Procurement Officer, 21 West St., New York 6, N. Y., until the following times, when they will be publicly opened: Invitation 197, 9:30 AM, December 2; Invitation 198, 11:00 AM, December 2; Invitation 199, 2:00 PM, December 2; Invitation 200, 10:30 AM December 9; Invitation 201, 2:00 PM, December 9, 1955. Additional information and bid forms available at Panama Canal Company, 21 West St., New York 6, N. Y. BO 9-5380.

CONTRACT MANUFACTURING

THE DIRECTORY OF PRODUCTION SERVICES

[This section appears in the first and third issues of each month. See advertisers index in these issues]

Carrying the announcements of plants offering specialized experience and facilities for the production of STAMPINGS, SPINNINGS, WELDMENTS, WIRE FORMS, SPRINGS, SCREW MACHINE PRODUCTS, FORGINGS, CASTINGS, GEARS, DIES, ASSEMBLIES, SPECIAL MACHINERY, and services such as MACHINE WORK, HEAT TREATING, PLATING, GALVANIZING, etc.

EQUIPMENT AND MATERIALS WANTED

THE BEST
IN
USED EQUIPMENT
HITS THE
CLEARING HOUSE
SELL YOURS
THE EASY WAY
THROUGH AN AD IN THE
IRON AGE

FOR SALE
ATTRACTIVE PRICES

1—40 Ton 36" gauge modern Diesel Electric Locomotive
1—50 Ton standard gauge modern Diesel Electric Locomotive
1—35 Ton standard gauge modern Diesel Electric Locomotive
1—48" Double End Punch and Shear, motorized.

SUNDFELT EQUIPMENT COMPANY, INC.
220 Hudson Street, Seattle 8, Washington
LAnder 9311

WE BUY AND SELL USED
OVERHEAD TRAVELING CRANES
STRUCTURAL BUILDINGS
Your Offerings and Inquiries Solicited
BENKART STEEL & SUPPLY CO.
CORAOPOLIS, PA.

WANTED
Industrial furnaces and heat treating equipment of all kinds.
THE JOE MARTIN CO., INC.
19256 John R., Detroit 3, Mich.
TWinbrook 2-9400

WANTED
for Immediate Purchase & Delivery

One stiffleg derrick, capacity 75 tons with boom at 45 degrees. Length boom 100 to 120 ft. Derrick to be complete with sheaves, wire rope & all fittings. Derrick swing 220 degrees. Hoist to be included. Powered by gasoline or diesel engine. Give hoist line pull and speed when quoting. Supply blueprints when quoting if available.

Answer to Reagan Equipment Co.
P. O. Box 10216 New Orleans 21, La.

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
36 Years of Steel Service

ROLLING MILL WANTED
Four stand 10" to 16" wide.
2-High tandem cold mill.
ADDRESS BOX G-180
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

WANTED
SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

Try the WANTED SECTION
for
***"Hard-to-Find"* Materials or Equipment**

WANTED
HEAT TREATING FURNACE — Continuous Rotary Retort Hardening Furnace similar to American Gas Furnace 136 or 139. Capacity 150 to 1000 lbs. per hour.
THE MELLOWES CO.
125 E. Nash St. Milwaukee 12, Wis.

Wanted forging quality steel, 1018 to 1029 carbon, from 2½" Rd. to 4" Round cornered Sq.
ADDRESS BOX G-190
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

BUSINESS OPPORTUNITIES

FOR SALE
Completely mechanized soil pipe foundry. Producing 15 Tons castings daily. Located near large city.
ADDRESS BOX G-184
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

25-ACRES—INDUSTRIAL SITE*
Less than 1½ hours to Philadelphia, Newark, and New York markets. Ideal location in Tom's River, N. J., in minutes to exit and entrance of Garden State Parkway.
ADDRESS BOX G-188
Care *The Iron Age*, Chestnut & 56th Sts. Phila. 39

Manufacturer desires to retire due to constant illness and is willing to sell license on royalty basis to one or more firms in their district. Light and medium, heavy and extra heavy inspection castings, we are willing to hear from principal only.
ADDRESS BOX 5-20, CARE OF THE IRON AGE
1016 National City Bank Bldg., Cleveland 14, Ohio

EMPLOYMENT EXCHANGE

HELP WANTED

EXPERIENCED ROLLER—For new Merchant Mill. Address Box G-193, care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39, Pa.

Want to clean house?
Use The Clearing House

HELP WANTED

ENGINEERS WANTED

MECHANICAL ENGINEERS, DESIGNERS, CHECKERS AND DRAFTSMAN, WHO ARE QUALIFIED PERSONNEL WITH EXPERIENCE IN HEAVY EQUIPMENT ARE REQUIRED FOR WORK ON SEVERAL PROJECTS. THE EQUIPMENT BEING PROCESSED COVERS ROLLING MILLS, STEEL MILL AUXILIARY EQUIPMENT, HYDRAULIC PRESSES, MATERIAL HANDLING EQUIPMENT AND SPECIAL MACHINERY.

ADDRESS BOX G-189
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

HELP WANTED

EASTERN FABRICATOR OF PLATE AND STRUCTURAL STEEL IN PENNA-JERSEY AREA
WANTS
CHIEF ENGINEER
DESIGNER-DRAFTSMAN
PURCHASING AGENT

Old established Company in phase of modernizing equipment and personnel. Excellent opportunity for experienced men in above classifications. State experience, past connections, education and positions held. Replies confidential.

ADDRESS BOX G-183
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

EMPLOYMENT EXCHANGE

WANTED: PRODUCTION ENGINEERS

The increasing complexity of products in Honeywell's expanding Aeronautical Controls Division has created several openings for experienced Production Engineers.

REQUIREMENTS

A broad engineering knowledge equivalent to B.M.E. or B.E.E. Degree, plus 5 years Production Engineering experience. Experience should have included major responsibility for process planning on new products, such as precision mechanical, electrical, or hydraulic equipment, electro-mechanical controls, servo-mechanisms, electric motors, instruments, or gyros. Thorough knowledge of tooling, estimating, metals fabrication, manufacturing, and assembly operations.

CONSIDER THESE ADVANTAGES:

Ideal suburban living in friendly, uncrowded Minneapolis, famous for its cultural activities, recreational facilities.

Generous employee benefits include broad company-paid insurance and pension plans, liberal tuition allowances for advanced study.

Travel and family moving expenses paid.

Please send résumé of your background including salary requirements, to:

J. A. HILL
Engineering Placement Manager
Minneapolis-Honeywell Regulator Company
2753 4th Avenue South
Minneapolis 8, Minnesota

MINNEAPOLIS **Honeywell** *First in Controls*

HELP WANTED

WANTED PLANT ENGINEER with electrical background for malleable iron foundry in New England. Must have had experience in supervising foundry plant maintenance. Full details will be given in personal interview. Write, giving all pertinent information. Address Box G-187, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39, Pa.

GRAY IRON SUPERINTENDENT

Thoroughly experienced in all phases of foundry operations, must be aggressive. Foundry located in Eastern Pennsylvania. All replies confidential, send complete resume with all details to

ADDRESS BOX G-179
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

METALLURGIST—Steel Foundry in East desires services of graduate metallurgist with some experience in acid and basic melting procedures and sand control. Please give full particulars regarding background and salary desired in first letter. Address Box G-186, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39, Pa.

ACCOUNTS WANTED

MANUFACTURER'S REPRESENTATIVE desires industrial lines in Indiana. Past experience in steel sales. College graduate. Address Box G-185, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39, Pa.

HELP WANTED

TITANIUM METALLURGIST — Either experienced man or one interested in entering this field covering titanium production in mill converting to bars, forgings, sheet, strip and wire. Work will include both the technical and production aspects of material. Send information giving education, experience, age, references, etc.

ADDRESS BOX G-181
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

METALLURGICAL GRADUATES—Openings in mill production metallurgical group and laboratory in mill producing high speed steels, tool steels, stainless, high temperature alloys and many specialty steels. Will consider both experienced men and recent graduates interested in these fields. Reply giving details of education, experience, age, references, etc. Address replies to Personnel Department, Universal-Cyclops Steel Corporation, Bridgeville, Pennsylvania.

SITUATIONS WANTED

CAPABLE, STABLE EXECUTIVE Desires Employment—Either Personnel or Operating Department. Twenty Years Integrated Plant Experience. Graduate Engineer. Resume Available upon Request. Address Box G-192, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

HELP WANTED

DESIGN ENGINEERS

Permanent Opportunities with

McKEE

IN OUR REFINERY, METALS OR INDUSTRIAL DIVISIONS AT OUR CLEVELAND, OHIO OFFICES

McKEE with more than 50 years of successful operation, doing business all over the world; is one of the largest, oldest and best known engineering and contracting firms in the business. The McKEE organization continues to grow and expand, thereby offers many present and future opportunities for qualified and experienced engineers and designers in the following fields:

PIPING
STRUCTURAL STEEL
CONCRETE
PROCESS HEATERS
EQUIPMENT SPECS.
ALSO
ELECTRICAL DRAFTS
LAYOUT ENGINEERS
PROCESS ENGINEERS

Applicants should have at least five years of experience.

Here is a rare opportunity for you to utilize your engineering abilities and talents.

McKEE offers top compensation commensurate with experience and ability. No age limitations.

Transportation & Moving Allowances.

PLEASE SEND RESUME TO:

Edward A. Kolner

ARTHUR G. McKEE & CO.
2300 Chester Ave.
Cleveland 1, Ohio

HELP WANTED

INDUSTRIAL ENGINEERS

Prefer Steel Mill Experience

Career opportunities are available for supervisory and non-supervisory industrial engineers with training or experience in methods engineering or incentive plans. If your present position does not fully utilize your capacity, we may have the opening you are looking for, with a future potential limited only by your demonstrated performance.

Must be willing to locate in Southern California at the Fontana plant of Kaiser Steel Corporation.

Send complete resume, including education, experience, and salary requirements to Employment Manager.

KAISER STEEL CORP.
P.O. BOX 217
FONTANA, CALIFORNIA

SITUATIONS WANTED

TWENTY YEARS steel sales, purchasing, office routine, warehouse, mill and export. Valuable mill, warehouse and consumer contacts. Highest reference readily available. Willing relocate. Address Box G-191, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

ADVERTISERS IN THIS ISSUE

An asterisk (*) beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturers for your copies today.

A

Abbey Etna Co. 48
Acme Equipment Co., Inc. 202
Aetna-Standard Engineering Co., Inc. 104, 105
Airtex Products, Inc. 206
*Ajax Electric Co., Inc. 4
Ajax Electric Furnace Corp. 4
Ajax Electrothermic Corp. 4
Ajax Engineering Corp. 4
Alan Wood Steel Co. 90
*Allegheny Ludlum Steel Corp. 195
Allis-Chalmers Mfg. Co. 55
Aluminium Limited Sales, Inc. 41
American Brass Co., The 159
American Gas Association 44
*American Gas & Electric Co. 48D
American Monorail Co., The 92
American Steel & Wire Div., United States Steel Corp. 150
Armco Steel Corp. 6
Armel, James P. 205
*Armstrong Bros. Tool Co. 210
Associated Spring Corp. 59
Atlantic Steel Products Co. 210
*Atlas Car & Mfg Co., The 143

B

Baker Bros., Inc. 49, 198
Bardons & Oliver, Inc. 20, 21
Barnes, Wallace, Co., Div., Associated Spring Corp. 59
Barnes-Gibson-Raymond, Inc., Div., Associated Spring Corp. 59
*Bellows Co., The 109
Belyea Co., Inc. 205
Benkart Steel & Supply Co. 207
Bennett Machinery Co. 204
Bethlehem Steel Co. 1
*Blanchard Machine Company, The 40
Bound Brook Oil-Less Bearing Co. 129
Brad Foote Gear Works, Inc. 138
Bristol Brass Corp., The 147
*Brooks Oil Co., The 16
Brownell, Hazard, Machine Tools, Inc. 202
Browning, Victor R., & Co., Inc. 210
*Buffalo Forge Co. 197
Bullard Co., The 96
Bullock Co. 206
*Burt Mfg. Co., The 106

C

Calumet Iron & Supply Co. 203
Canton Drop Forging & Mfg. Co., The 209
*Carborundum Co., The Ferro Carbo Div. 172, 176
Carlson, G. O., Inc. 108
Carpenter Steel Co., The 99
Chicago Electric Co. 205
*Chicago Rawhide Manufacturing Co. 112
*Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp. 136
*Cincinnati Bickford Tool Co., The 12
*Cleveland Tramrail Division, The Cleveland Crane & Eng. Co. 48B
Cold Metal Products Co., The 66
Columbia-Geneva Steel Div., United States Steel Corp. 150
Columbia Tool Steel Co. 175
Conco Engineering Works, Crane & Hoist Div. 131
Consolidated Machine Tool Corp. 24, 25
Consolidated Railway Equipment Co. 205
*Copperweld Steel Co., The ..... Inside Front Cover
Crawford, F. H., & Co., Inc. 203
Cromwell Paper Co. 52
Cross Company, The 80
*Crucible Steel Co. of America 17
Cutler-Hammer, Inc. ..... Back Cover

D

Darien Corporation, The 202
Davis, Samuel M. 206
Detroit Stamping Co. 102
De Vilbiss Co., The 132, 133
*Diamond Manufacturing Co. 209
Dodge Manufacturing Corp. 36
Donahue Steel Products Co., Inc. 203
Dony, D. E., Machinery Co. 203
Drais & Krump Mfg. Co. 198
Dunbar Bros. Co., Div. Associated Spring Corp. 59

E

Eastern Machine Screw Corp., The 209
Eastern Machinery Co., The 204
Electric Equipment Co. 205
Electro Manganese Corporation 176
Espen-Lucas Machine Works, The 210
Etna Abbey Co. 48
*Exide Industrial Division, The Electric Storage Battery Co. 98
*Ex-Cell-O Corporation 178

F

Fabrikant Steel Products, Inc. 205
Fairbanks, Morse & Co. ..... Front Cover
Falk Machinery Co. 204
Fate-Root-Heath Co. 46
*Federal Bearings Co., Inc. 48C
Fenn Manufacturing Co., The 160
*Finkl, A., & Sons Co. 53
Foster, Frank B., Inc. 202
Foster, L. B., Co. 206
Frank, M. K. 206
*Frauenthal Div., The Kaydon Engineering Corp. 170, 171

G

*General Electric Co., Apparatus Dept. 18, 19, 23
General Refractories Co. 135
Gerrard Steel Strapping Div., U. S. Steel Corp. 43
Gibson, Wm. D., Co., Div. Associated Spring Corp. 59
*Gisholt Machine Co. 48A
Globe American Corp., Macomb Div. 204
Goodman Electric Machinery Co. 204
Goodyear Tire & Rubber Co. 10
Goss & DeLeeuw Machine Co. 209
Gray, G. A., Company 173
Great Lakes Steel Corp. 83
Grieder Industries, Inc. 58
Griffin Manufacturing Co. 209

H

Hanna Furnace Corp., The 156
Henry, A. T., & Company, Inc. 203
Hetz Industries 202
*Homestead Valve Manufacturing Co. 111
Hoover Ball & Bearing Co. 174
Hughes, Arnold, Co. 205, 207
Hyatt Bearings Div., General Motors Corp. 54
Hyde Park Foundry & Machine Co. 174
Hydraulic Press Mfg. Co., The 61
Hyman, Joseph, & Sons 202

I

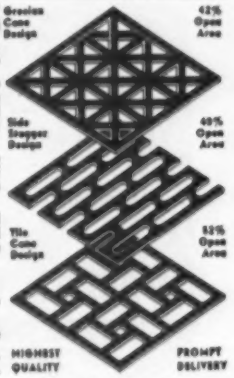
*Illinois Tool Works 169
Independent Engineering Co., Inc. 145
*International Nickel Co., Inc., The 187
Iron & Steel Products, Inc. 200
Ivins, Ellwood, Steel Tube Wks., Inc. 210

J

*Johns-Manville Corp. 22
*Jones & Lamson Machine Co. 28, 29
*Jones & Laughlin Steel Corp. 79, 167

(Continued on Page 210)

PERFORATED METALS
FOR EVERY INDUSTRIAL USE



The "Ornamental" light-gauge designs here illustrated are only a few of the many you can choose from in our new Catalog 39 and we are always pleased to quote on original designs or special work of any kind.

For larger unit-openings, using metals up to ¼" in thickness, we offer a wide variety of equally attractive designs in our Catalog 36 on Diamond Architectural Grilles.

Send us your blueprints. We are equipped to fabricate special sections to any desired extent and welcome opportunities to make money-saving suggestions.

DIAMOND MANUFACTURING CO.
Box 41 WYOMING PENNA.
(Wilkes-Barre Area)

Sales Representatives in all principal cities. Consult Your Classified Telephone Directory.

H&G Insert Chaser DIE HEADS

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 21-41 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Behringer, Inc., 334 N. San Pedro St., Los Angeles, California* Canada: *F. F. Barber Machinery Co., Toronto, Canada*

LELAND-GIFFORD

the BIG NAME in DRILLING MACHINES

LELAND-GIFFORD COMPANY, WORCESTER, MASSACHUSETTS

more and more manufacturers are saying: "Let's use

GRIFFIN®
COLD ROLLED STRIP STEEL"

Made to your specifications in all thicknesses from .002 to .375 inches and widths from ½" to 19" depending upon gauge.

NARROW ROLLED ROUND EDGE STRIP STEEL *In stock at*
CENTRAL STEEL & WIRE CO.
Detroit, Chicago, Cincinnati
Wm. H. LEONORI & CO., Inc.
New York City

GRIFFIN
"since 1899"
MANUFACTURING CO. ERIE, PA.

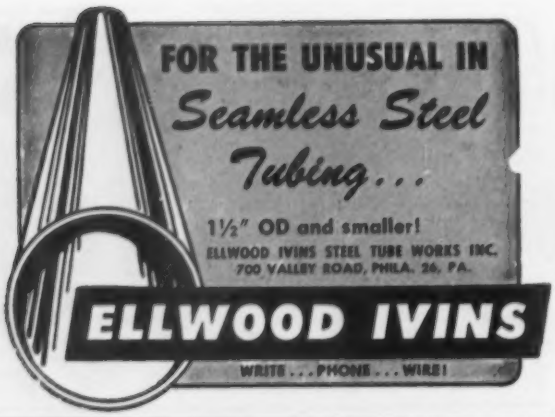
GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

FORGINGS

ALL SIZES, pressed . . rolled . . extruded . . forged to accurate specifications from carbon, alloy, stainless steels and special metals. Modern metallurgical, die, heat-treating and rough machining facilities.

Over 50 years of forging design and development

THE CANTON DROP FORGING & MFG. CO.
CANTON, OHIO


FOR THE UNUSUAL IN
Seamless Steel Tubing...
1½" OD and smaller!
ELLWOOD IVINS STEEL TUBE WORKS INC.
700 VALLEY ROAD, PHILA. 26, PA.
ELLWOOD IVINS
WRITE . . . PHONE . . . WIRE!

ATLANTIC STEEL PRODUCTS CO.
1330 N. 30th St., Philadelphia 21, Pa.
From Stock
BARS • STRIP • SHEETS • PLATES

STEEL TUBING
SEAMLESS or WELDED
AIRCRAFT - MECHANICAL
PRESSURE - STAINLESS
SERVICE STEEL
STAINLESS PIPE & FITTINGS
DETROIT - BUFFALO - CHICAGO - CINCINNATI - LOS ANGELES

ARMSTRONG *Drop Forged* EYE BOLTS
Drop forged from the best mild steel, heat treated to increased tensile strength and proof-tested to 50% beyond rated "safe working load." ARMSTRONG Eye Bolts are strong, dependable and safe. Blank or threaded, "Plain or Shoulder" patterns. 15 standard sizes and special lengths. Write for Catalog.
ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5200 ARMSTRONG AVE. CHICAGO 30, U. S. A.

CONNECTICUT PRESS BRAKES and DIES
ALSO COMPLETE LINE OF HAND BRAKES
BUILT BY W. WHITNEY STUECK, INC.
100 CONN. AVE., OLD SAYBROOK, CONN.

Cutting off Machines for Sawing All Kinds of Metals
THE ESPEN-LUCAS MACHINE WORKS
FRONT AND GIRARD AVE., PHILADELPHIA, PENNA.

ADVERTISERS IN THIS ISSUE

(Continued from Page 209)

K

Kaiser Steel Corp. 208
Kaplan, M. S., Company 185
Kasle Steel Corp. 206
*Kaydon Engineering Corp., The .. 163
*Kemp, C. M., Mfg. Co., The 88
Keokuk Electro-Metals Co. 8
Kidde, Walter, & Co., Inc. 13
Kirk & Blum Mfg. Co. 144
*Kling Bros. Engineering Works .. 94

L

Lamson & Sessions Co., The 103
Land, L. J., Inc. 206
Landis Machine Co., Inc. 14, 15
Lang Machinery Co. 204
Lansing Stamping Co. 172
*LeBlond, R. K., Machine Tool Co., The 30, 31
Lees-Bradner Co., The 46
Leland-Gifford Co. 209
*Link-Belt Co. 37
*Lodge & Shipley Co., The Between Pages 96, 97
*Lovejoy Flexible Coupling Co... 177
Lurie Bros. & Co., Inc. 183

M

McKay Machine Co., The 153
McKee, Arthur G., & Co. 208
McLouth Steel Corp. Between Pages 96, 97
MacCabe, T. B., Co. 205
Magnethermic Corp. 149
*Mahon, R. C., Co., The 107
Makepeace, D. E., Company, Div. of Union Plate & Wire Co. 198
*Manco Mfg. Co. 157
*Manning, Maxwell & Moore, Inc. 146
*Marchant, Geo. F., Co. 158
Martin, Joe, Co., Inc., The 207
Mars Mfg. & Machine Co. 206
*Mattison Machine Works 40
Mellows Co. 207
Miles Machinery Co. 202, 203, 204 & 205
*Miller Electric Mfg. Co., Inc.... 50
Minneapolis, Honeywell 208
*Minnesota Mining & Manufacturing Co. ..... Between Pages 16, 17
Mississippi Valley Equipment Co. 204
Morgan Construction Co. 6
Morrison Railway Supply Co. 205
*Mundt, Chas., & Sons 198
Murray Tube Works 205

N

National Acme Co., The 142
National Broach & Machine Co... 56
*National Conveyors Co., Inc. Between Pages 96, 97
National Machinery Exchange.... 204
National Steel Corp. 83, 156
National Tube Div., United States Steel Corp. 150
*Niagara Blower Co. 177
Northern Engineering Works 148

O

O'Neil-Irwin Mfg. Co. 9
*Ohio Crankshaft Co., The 47
Ornitz Equipment Corp. 205

P

Palmer-Shile Co. 137
Parker-Kalon Div., General American Transportation Corp. 32, 33
Pathex (Canada) Limited 206
Perkins Machine & Gear Co. 154
*Philadelphia Gear Works, Inc.... 51
Pittsburgh Crushed Steel Co. 130
*Plymouth Locomotive Works Div. of The Fate-Root-Heath Co. 46
Pollard Bearings, Ltd. 100
*Pope Machinery Corp. 164
Portage Machine Co., The Between Pages 16, 17
Porter, H. K., Co., Inc. 139
Purdy Company, The 204

R

Raymond Manufacturing Co., Div. Associated Spring Corp. 59
*Ready-Power Co., The 140
Regan Equipment Co. 207
*Reliance Electric & Engineering Co. 86
Republic Machinery Co. 202
*Republic Steel Corp. 34, 35
*Reynolds Metals Co. Between Pages 48, 48A
Roebling's, John A., Sons Corp. Between Pages 16, 17
Russell, Burdsall & Ward Bolt & Nut Co. 85
Ruthman Machinery Co., The 138
*Ryerson, Jos. T., & Son, Inc. 44

S

SKF Industries, Inc. 42
Service Steel, Div. Van Pelt Corp. 210
Sessions, J. H., & Son 176
Sheldon, James E. 206
Simmons Machine Tool Corp. 175
Socony Mobil Oil Co., Inc. 57
*Spincraft, Incorporated 165
*Standard Pressed Steel Co. 199
*Steel Products Engineering Co., The 43
Steel Shot Producers, Inc. 130
Steel & Tube Div. Timken Roller Bearing Co. 155
Stone, R. J. 204
Stueck, W. Whitney, Inc. 210
Sundfelt Equipment Co., Inc. 207

T

Tennessee Coal & Iron Div., United States Steel Corp. 150
Thunder Bay Mfg. Corp. 204
*Timken Roller Bearing Co., The 155
*Towmotor Corp. 134
*Traben Engineering Corp. Inside Back Cover
Tractor & Equipment Co. 205

U

United Engineering & Foundry Co. Between Pages 96, 97
*U. S. Pipe & Foundry Co. 26, 27
United States Steel Export Co. ... 150
*United States Steel Corp. 43, 150
United States Steel Supply Div., United States Steel Corp. 150
Universal Cyclops Steel Corp. ... 208

V

*Victor Saw Works, Inc. 11
Virginia Gear & Machine Corp... 51

W

Wagner Electric Corp. Between Pages 80, 81
Wallack Bros. 206, 207
Washington Steel Corp. 158
Waterbury-Farrel Foundry & Machine Co. 42
Wean Equipment Co. Between Pages 80, 81
Weiss Steel Co., Inc. 207
Western Machinery Co. 204
Westinghouse Electric Corp. ... 38, 39
Wheeler, C. H., Manufacturing Co. 204
Wheland Co., The 176
*Willson Products, Inc. 152
Winternitz, Samuel L., & Co. 201
*Wyandotte Chemicals Corp. 141
Wyckoff Steel Co. 110

Y

*Yale & Towne Mfg. Co., Powdered Metal Products Div. 151
Youngstown Sheet & Tube Co., The ..... Between Pages 80, 81

CLASSIFIED SECTION

Business Opportunities 207
Clearing House 200-206
Contract Manufacturing Appears in first and third issue of each month. See Oct. 20 & Nov. 3
Employment Exchange 207
Equipment & Materials Wanted.. 207

HOW TO AUTOMATE A GREASE JOB

Here is one of the latest marvels of automated production. This 21 station automatic transfer machine, manufactured by Snyder Tool & Engineering, Detroit, Michigan, machines 130 intake manifolds an hour. To guard this expensive equipment against wasteful down-time, it is lubricated *automatically* with a TRABON Central Lubrication System.

TRABON systems are ideal when man hours are important! A simple, centrally located control provides the correct amount of lubrication to every bearing, automatically. The sealed, pressurized system locks out dirt and foreign matter and prevents chips from working between bearing surfaces.

TRABON designs systems for all types of machine tools. Whether your machine is a drill press or a giant automated line, there is a TRABON system to fit your needs.

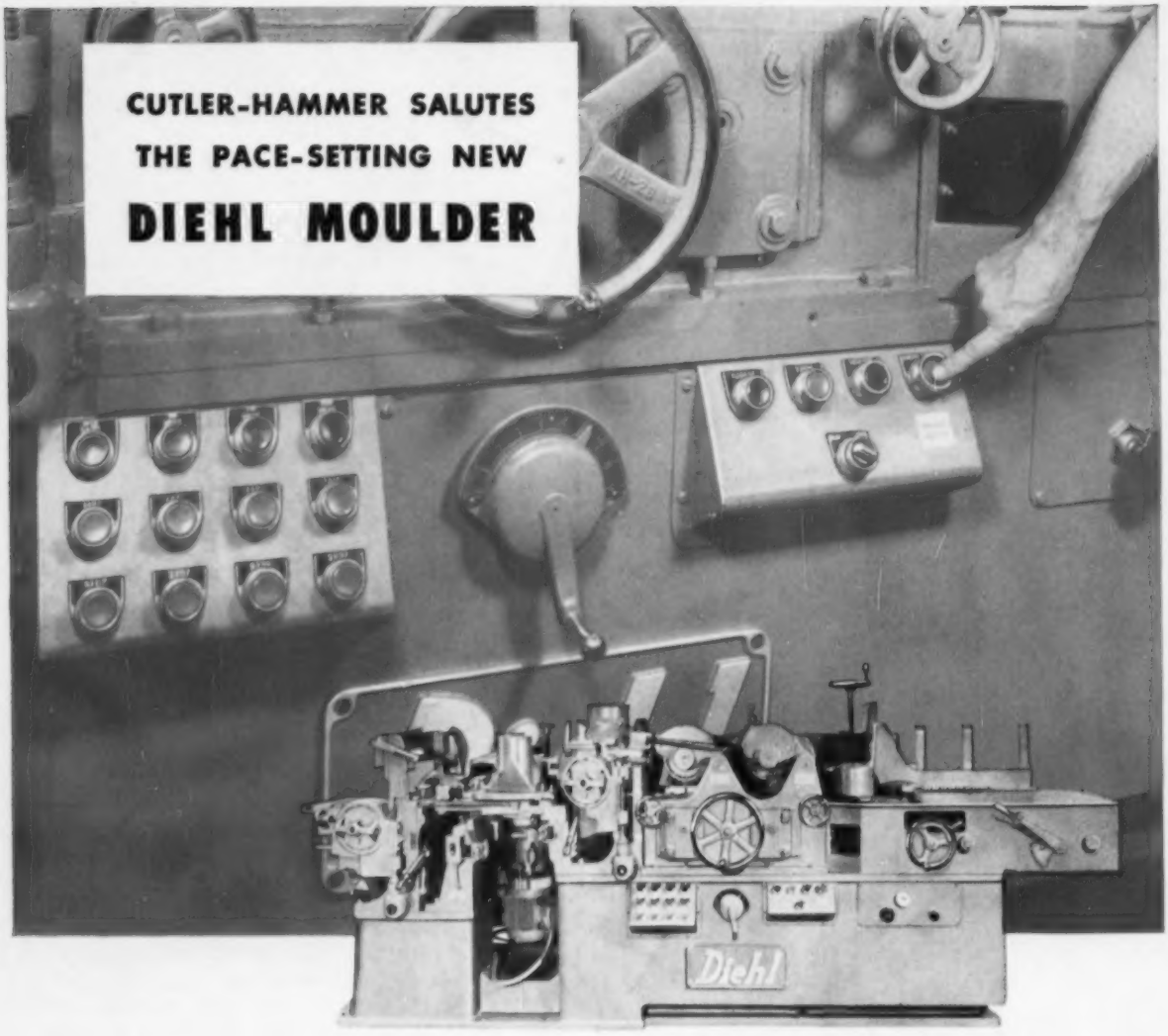
Write for machine tool bulletin 5410.

Trabon

ENGINEERING CORPORATION

1814 E. 40th STREET • CLEVELAND 3, OHIO

Oil and Grease Systems



The New Diehl 12" Moulder

Cutler-Hammer Three-Star Motor Control is featured. More than twenty such components are standard equipment on the compact control panel of each machine. All pushbuttons for control of the machine's functions are the new Cutler-Hammer Heavy Duty Oil-Tight Pushbuttons.

The G. M. Diehl Machine Works, Inc., Wabash, Indiana has long been recognized as a leading manufacturer of dependable woodworking machinery. Dependability is important in woodworking machinery. The service is rugged. The conditions under which woodworking machines operate impose many problems not found in other industries.

Cutler-Hammer is proud to salute this fine company for its well-earned reputation . . . and for its latest achievement in advanced engineering, the new Diehl 12" Moulder.

Typical of the leadership shown in the design of the new Diehl 12" Moulder is the motor control used. Cutler-Hammer Three-Star Motor Control is featured. More than twenty such components are standard equipment on the compact control panel of each machine. All pushbuttons for control of the machine's functions are the new Cutler-Hammer Heavy Duty Oil-Tight Pushbuttons. By all comparisons, this is the finest electrical equipment available . . . the natural choice wherever precise performance and dependability are basic design objectives. CUTLER-HAMMER, Inc., 1325 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.

CHOICE OF THE LEADERS
CUTLER-HAMMER
MOTOR CONTROL
C-H
THE MARK OF BETTER MACHINES